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(U) AIR FORCE SPECIAL OPERATIONS COMMAND
(U) Hurlburt Field, Florida

(U) ENVIRONMENTAL REVIEW

(U) FOR THE

(U) CV-22 BEDDOWN AT
YOKOTA AIR BASE



24 Feb 15

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(U) LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

(U) 374 AMDS/SGPB	Bioenvironmental Engineering Flight
(U) 374 AW/SE	Wing Safety
(U) 374 CES/CEANC	Conservation/Environmental Element
(U) 374 CES/CEIE	CE Environmental Element
(U) 374 LRS/LGRMSH	HazMart Pharmacy
(U) 374 OSS/OSAR	Radar Approach Control (RAPCON)
(U) 374 OSS/OSAT	374 Operations Support Squadron Tower
(U) 374 AW/HO	374th Air Wing
(U) A7CIB	Air Force Civil Engineering Planning Division Basing Branch
(U) AAD	average annual day
(U) AAFES	Army and Air Force Exchange Service
(U) ACAM	U.S. Air Force Air Conformity Applicability Model
(U) ADP	Area Development Plan
(U) ADT	Average Daily Traffic
(U) AEI	Air Emissions Inventory
(U) AFCEE	Air Force Center for Environmental Excellence (now known as Air Force Civil Engineer Center)
(U) AFI	Air Force Instruction
(U) AFOSH	Air Force Occupational Safety and Health
(U) AFPD	Air Force Policy Directive
(U) AFSOC	U.S. Air Force Special Operations Command
(U) AGE	aerospace ground support equipment
(U) AGL	above ground level
(U) AIP	Japan Aeronautical Information Publication
(U) AM	Airspace Management
(U) AMU	Aircraft Maintenance Unit
(U) ASTs	above-ground storage tanks
(U) AT/FP	Anti-Terrorism/Force Protection
(U) ATARS	Air Traffic Activity Reporting System
(U) ATC	Air Traffic Control
(U) ATIS	Automatic Terminal Information Service
(U) BASH	Bird/Wildlife-Aircraft Strike Hazard
(U) Bgs	below ground surface
(U) BMPs	Best Management Practices
(U) BOD	Biochemical Oxygen Demand
(U) BOE	Board of Education.
(U) BWC	Bird Watch Conditions
(U) C&D	construction and demolition
(U) CAPP	Compliance Assurance and Pollution Prevention
(U) CE	Civil Engineer
(U) CEQ	U.S. Council on Environmental Quality
(U) CFR	Code of Federal Regulations
(U) CGO	Company Grade Officer Quarters
(U) CHABA	Committee on Hearing, Bioacoustics, and Biomechanics
(U) CITES	Convention on International Trade in Endangered Species
(U) CMA	Controlled Movement Area
(U) CNEL	Community Noise Equivalent Level
(U) CO	carbon monoxide
(U) CONUS	Continental United States
(U) CTIT	Turbine Inlet Temperature, in degrees Celsius
(U) CVW-5	U.S. Navy Carrier Wing Five
(U) dB	decibel

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(U)	DC	direct current
(U)	DDESB	U.S. Defense Department Explosives Safety Board
(U)	DFAS	U.S. Defense Finance Accounting Service
(U)	DLA-DS	U.S. Defense Logistics Agency Disposition Services
(U)	DNL	day-night average sound level
(U)	DoD	U.S. Department of Defense
(U)	DoDEA	U.S. Department of Defense Education Activity
(U)	DoDI	U.S. Department of Defense Instruction
(U)	DODDS	Department of Defense Dependant Schools
(U)	DON	U.S. Department of the Navy
(U)	E	East
(U)	EIAP	Environmental Impact Analysis Process
(U)	EMS	Environmental Management System
(U)	ER	Environmental Review
(U)	ERM	Energy Recovery Material
(U)	°F	degrees Fahrenheit
(U)	FAA	U.S. Federal Aviation Administration
(U)	FAS	Federation of American Scientists
(U)	FGO	Field Grade Officer Quarters
(U)	FGS	Final Governing Standards
(U)	FL	Flight Level
(U)	FY	fiscal year
(U)	GIS	geographic information system
(U)	GOQ	General Officer Quarters
(U)	GOVs	government-owned vehicles
(U)	GSU	geographically separated unit
(U)	HAP	High Accident Potential
(U)	HATR	High Air Traffic Report
(U)	HAZMAT	hazardous materials
(U)	HRMA	Housing Requirements and Market Analysis
(U)	HTHW	high temperature hot water
(U)	HVAC	heating/ventilation/air conditioning
(U)	HWGP	Hazardous Waste Generation Point
(U)	HWMP	Hazardous Waste Management Plan
(U)	HWSA	Hazardous Waste Storage Area
(U)	Hz	Hertz
(U)	IAP	Initial Accumulation Point
(U)	ICRMP	Integrated Cultural Resources Management Plan
(U)	IDP	Installation Development Plan
(U)	IFR	Instrument Flight Rules
(U)	INRMP	Integrated Natural Resources Management Plan
(U)	ISWMP	Integrated Solid Waste Management Plan
(U)	JASDF	Japan Air Self-Defense Force
(U)	JEGS	Japan Environmental Governing Standards
(U)	JGSDF	Japan Ground Self-Defense Force
(U)	JMSDF	Japan Maritime Self-Defense Force
(U)	JNCO	Junior Non-Commissioned Officer Housing
(U)	JSOC	Joint Special Operations Command
(U)	km	kilometer
(U)	KTS	Engine collective required to fly the aircraft at n knots
(U)	kV	kilovolt
(U)	lbs	pounds
(U)	L_{den}	day-evening-night average sound levels
(U)	L_{dn}	day-night average sound levels (no penalty for evening operations)

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(U) LFN	low-frequency noise
(U) L_{max}	maximum noise level
(U) L_{pk}	peak sound level
(U) L_x	Noise Level Exceeded during "x" percent of a study period (e.g., L ₉₀)
(U) MACA	Mid-Air Collision Avoidance
(U) MAJCOM	major command
(U) MARSOC	Marine Corps Forces Special Operations Command
(U) MEA	Minimum Enroute Altitude
(U) MGD	million gallons per day
(U) MILCON	Military Construction
(U) MLIT	Ministry of Land, Infrastructure, Transport and Tourism
(U) mm	millimeter
(U) MOGAS	motor vehicle gasoline
(U) MRSP	Mobility Readiness Spares Packages
(U) MSAs	Munitions Storage Areas
(U) MSL	mean sea level
(U) N	North
(U) n/a	Not applicable
(U) Nacelle Tilt	a primary predictor of CV-22 noise level is the degree of nacelle tilt
(U) NAF	Non-Appropriated Fund
(U) NAVSPECWARCOM	Navy Special Warfare Command
(U) NEPA	National Environmental Protection Act
(U) NM	nautical miles
(U) NOISEMAP	A computer program that calculates noise levels
(U) NO_x	nitrogen oxides
(U) NR/NV	non-road vehicles/non-vehicular equipment
(U) NT	Near Threatened
(U) NTA	Northern Training Area
(U) ODB	Okinawa Defense Bureau
(U) ODS	ozone-depleting substances
(U) OSS	Operations Support Squadron
(U) P2	Pollution Prevention
(U) PACAF	United States Pacific Air Forces
(U) PACAF/A3TO	United States Pacific Air Forces/Operations and Training Branch
(U) PCB	polychlorinated biphenyl
(U) PM₁₀	particulate matter less than or equal to 10 microns in diameter
(U) PM_{2.5}	particulate matter less than or equal to 2.5 microns in diameter
(U) POS	Peacetime Operating Stock
(U) POVs	privately owned vehicles
(U) QD	quantity distance
(U) RAPCON	Radar Approach Control
(U) RDB	Red Data Book of Japan
(U) ROI	Region of Influence
(U) RPM	revolutions per minute
(U) SCAP	[Administration by the] Supreme Commander, Allied Powers
(U) SEL	sound exposure level
(U) SF	square feet
(U) SNCO	Senior Non-Commissioned Officer Housing
(U) SO₂	sulfur dioxide
(U) SOCOM	Special Operations Command
(U) SOFA	Status of Forces Agreement
(U) SOG	Special Operations Group
(U) SOQ	Senior Officer Quarters
(U) SOW	Special Operations Wing

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(U) SO_x	sulfur oxides
(U) SWPPP	Storm Water Pollution Prevention Plan
(U) TEPCO	Tokyo Electric Power Co.
(U) TLF	Temporary Lodging Facility
(U) U.S.	United States
(U) U.S.A.	United States of America
(U) USACE	U.S. Army Corps of Engineers
(U) USAF	U.S. Air Force
(U) USASOC	U.S. Army Special Operations Command
(U) USEPA	U.S. Environmental Protection Agency
(U) USPACOM	United States Pacific Command
(U) USPACOM/J445	Environmental Office of the United States Pacific Command
(U) USSOCOM	United States Special Operations Command
(U) UST	underground storage tank
(U) UXO	unexploded ordnance
(U) VFR	visual flight rules
(U) VOC	volatile organic compounds
(U) VPH	vehicles per hour
(U) VQ	Visiting Quarters
(U) VU	Vulnerable
(U) WESTPAC	Western Pacific
(U) WHPAs	Wellhead Protection Areas
(U) YAB	Yokota Air Base

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(U) 1. PURPOSE OF AND NEED FOR ACTION

(U) 1.1 INTRODUCTION

(U) The U.S. Air Force Special Operations Command (AFSOC) has prepared this Environmental Review (ER) to identify the important environmental issues associated with the proposed beddown of the CV-22 at Yokota Air Base (YAB), Japan. The CV-22 beddown at YAB would provide capabilities to AFSOC. Figure 1-1 depicts the regional setting of the Proposed Action. YAB is shown in Figure 1-2. Construction of additional facilities is needed for the maintenance, training, and operation of the aircraft; and other related or affected construction, renovation, and consolidation actions.

(U) 1.2 OVERVIEW OF THE SOCOM MISSION

(U) The United States Special Operations Command (USSOCOM or SOCOM), established in 1987 at MacDill Air Force Base, Florida, is 1 of 10 unified combatant commands. The mission of SOCOM is to provide war and peacetime special operations support to regional combatant commanders, American ambassadors and their country teams, and to the National Command Authority (the U.S. President and Secretary of Defense). SOCOM has four service component commands: AFSOC at Hurlburt Field, Florida; Army Special Operations Command (USASOC) at Fort Bragg, North Carolina; Navy Special Warfare Command (NAVSPECWARCOM) at Coronado, California; and Marine Corps Forces Special Operations Command (MARSOC) at Camp Lejeune, North Carolina. SOCOM also has one sub-unified command, the Joint Special Operations Command (JSOC) located in Fort Bragg, North Carolina (SOCOM, 2013).

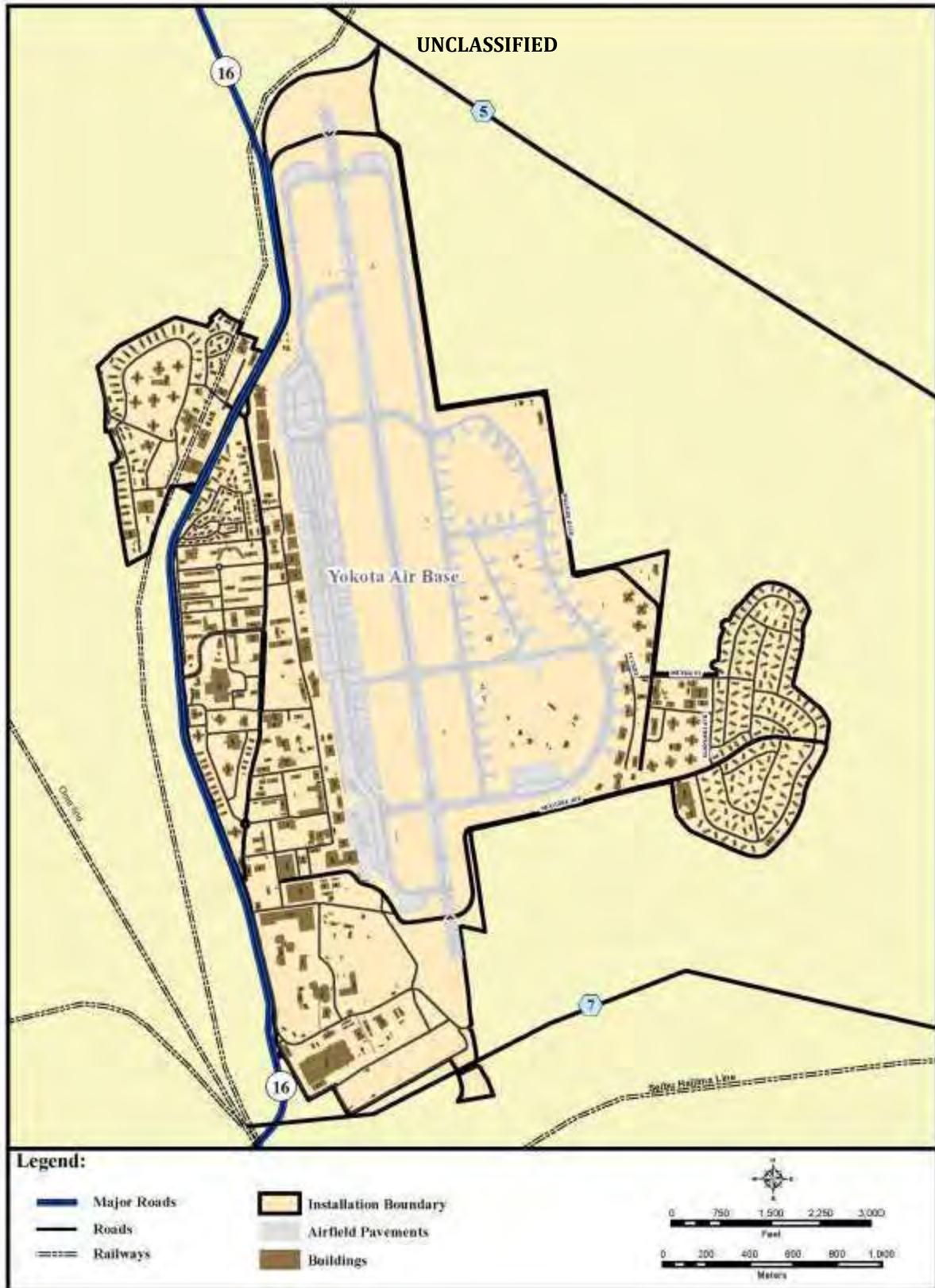
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(U) Figure 1-1. Regional Perspective

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(U) Figure 1-2. Yokota Air Base, Japan

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(U) Environmental Review Framework

AFSOC has determined that an ER is required for the CV-22 beddown at YAB. This ER has been prepared in compliance with:

- **(U)** Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions*.
- **(U)** 32 Code of Federal Regulations (CFR) Part 187, *Environmental Effects Abroad of Major Department of Defense Actions*.
- **(U)** 32 CFR 989, *Environmental Impact Analysis Process (EIAP)*.
- **(U)** Department of Defense (DoD) Directive 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*.

(U) This ER has also been prepared in consideration of the Japan Environmental Governing Standards (JEGS) (U.S. Forces Japan, 2012). The JEGS provide specific policies, procedures, and environmental compliance criteria for DoD installations in Japan. They were developed by U.S. Forces Japan to ensure DoD installations in Japan protect human health and the environment. The JEGS do not address environmental analysis, but were considered during preparation of this ER.

(U) The Executive Order 12114 directs Federal agencies to consider environmental impacts in making decisions regarding actions of the Federal government occurring outside the geographical borders of the United States and its territories and possessions. Actions subject to Executive Order 12114 include major Federal actions significantly affecting (1) the environment of the global commons, (2) the environment of a foreign nation, or (3) natural or ecological resources of global importance designated for protection. The Executive Order does not mandate requirements of the National Environmental Policy Act (NEPA) overseas, but it furthers the purpose of NEPA consistent with the foreign policy and national security policy of the United States. NEPA requires Federal agencies to consider environmental issues when making decisions on proposed actions occurring within the United States or its territories and possessions.

(U) DoD Directive 6050.7 (which was formally promulgated, published in the Federal Register, and is codified at 32 CFR Part 187) provides policies, definitions, and procedures to implement Executive Order 12114 for DoD Components. Like Executive Order 12114, the associated DoD Directive does not export the requirements of NEPA, but furthers the purpose of the Act. The DoD directive limits the requirement to conduct environmental impact analysis to only those major Federal actions that significantly harm the global commons, ecological resources of global importance, or the environment of a foreign nation, or that provide a toxic or radioactive emission or effluent to a foreign nation. An ER is a unilateral survey of the important environmental issues involved in a proposed major Federal action. It does not include all possible environmental issues or the detailed evaluation required in an environmental study. The ER must include a description of the proposed action, an identification of the important environmental issues, aspects of the proposed action that ameliorate or minimize the impact on the environment, and any actions taken or planned by a participating foreign government that will affect environmental considerations. The Air Force's Environmental Impact Analysis

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Process (32 CFR 989) provides procedures for environmental impact analysis for major Federal actions that occur within the United States and actions that occur abroad. Sections 37 and 38 of 32 CFR 989 address the procedures and requirements for analysis abroad through referring to 32 CFR 187, *Environmental Effects Abroad of Major Department of Defense Actions*, for implementation.

(U) The ER will be circulated for review and comment by AFSOC to Air Force reviewers having secret security clearances. The Air Force Civil Engineering Planning Division Basing Branch (USAF/A7CIB) coordinates the ER's availability to the Department of State and other international foreign governments, in addition to the Environmental Office of the United States Pacific Command (USPACOM/J445). After the ER has been declassified, AFSOC or the Department of State may distribute the ER to Air Force and civil engineering personnel on YAB for additional review. If analysis concludes that the proposed action would result in no significant harm to environmental resources, the base commander will sign a Finding of No Significant Harm Scope of the Environmental Review

(U) The Air Force prepared this document in accordance with the regulations outlined for DoD installations overseas (Section 1.5) and with consideration of the JEGS. Since the Proposed Action is located overseas, the applicable environmental impact analysis requirements are DoDD 6050.7, 32 CFR 187, and 32 CFR 989. U.S. NEPA requirements, including the requirement for public involvement, do not apply. Under those authorities, environmental impact analysis and the review of issues that are pertinent to the region of influence (ROI) is performed in accordance with DoD policy (DoDD 6050.7 and 32 CFR 187), and U.S. Air Force implementation of that policy (32 CFR 989.37 and 989.38). This section identifies the issues that were eliminated from review and the issues that are carried forward in the review.

(U) 1.2.1 Issues Eliminated from the Environmental Review

(U) Land Use

(U) The area proposed for facility construction and pavement expansion is within an area of YAB that is already developed and utilized for similar purposes, identified in the IDP as within the Airfield Operations Planning District. The existing land uses of the proposed sites and nearby vicinity are currently zoned as Aircraft Operations/Maintenance, Airfield Clearance, Airfield Pavement, Administration, and Industrial. There are no conflicts with the Future Land Use Map of the base. Additionally, there are no foreseeable changes in existing land use of the community outside the flightline area that would create conflicts with the Proposed Action. Land use issues were not analyzed in this review due to the appropriately zoned installation land use. The Proposed Action would not change the existing land use profile or create further conflicts on or off the installation.

(U) Soils

(U) Due to the nature of the proposed activity and local soil characteristics, there is little potential for soil erosion from the proposed renovation and construction associated with the

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beddown. Existing management principles and practices employed to minimize the removal and transportation of soil are considered adequate.

(U) Floodplains

(U) Floodplains have not been delineated within the installation boundaries. The JEGS, or any other regulatory document, do not mandate floodplain protection on the installation but encourage that floodplains and drainage ways be used for open space and recreation. A visual tour of the proposed site locations did not reveal any floodplains or low-lying areas that would be impacted by the proposed facilities. The issue of potential impact to floodplains is not discussed in this ER.

(U) 1.2.2 Issues Carried Forward in the Environmental Review

(U) Airspace

(U) The airspace utilization required for routine CV-22 training operations at YAB is reviewed for uses potentially conflicting with other military missions or civilian uses, and for safety issues.

(U) Noise

(U) The noise profile from current operations on the installation is examined in relation to the modeled noise output from CV-22 operations to determine if noise from those aircraft would significantly increase public exposure to installation noise. Existing noise abatement procedures and any proposed new procedures that ameliorate impacts are reviewed.

(U) Air Quality

(U) YAB's existing Air Emissions Inventory (AEI) and the JEGS are reviewed for regulatory requirements corresponding to the Proposed Action.

(U) Safety

(U) Issues regarding ground and flight safety associated with operations conducted within the ROI are examined. The safety analysis addresses operations within the existing airspace. Standard and accepted safety practices are reviewed for operations activities.

(U) Transportation

(U) Potential impact to traffic and transportation on and near YAB resulting from the increase in CV-22 personnel is reviewed. New access roads would be constructed on base for some of the projects. The analysis addresses the capacity of existing roads to accept an increase in vehicles from personnel associated with the Proposed Action.

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(U) Infrastructure (Utilities)

(U) The proposed construction of facilities and increase of personnel on YAB resulting from the establishment of the CV-22 may require additional utility consumption such as water, electricity, and sewage treatment. The potential impact of these new activities on utilities infrastructure is reviewed.

(U) Hazardous Materials/Waste and Solid Waste

(U) Management of hazardous materials/waste and solid waste is reviewed in accordance with the JEGS the base's *Integrated Solid Waste Management Plan* (YAB, 2011), *Hazardous Material Management Plan & Ozone Depleting Substances Management Plan* (YAB, 2011a), *Hazardous Waste Management Plan* (YAB, 2013), *Spill Prevention and Response Plan* (YAB, 2012a) and *Asbestos Management and Operations Plan* (YAB, 2010a). This includes reviewing criteria in the JEGS for the storage, handling, transportation, and disposition of hazardous materials used in the Proposed Action, along with the installation's procedures for handling these materials. The types and quantities of hazardous waste generated from the Proposed Action are reviewed to determine if existing hazardous waste management practices on the installation are adequate to manage these additional wastes. The analysis also discusses potential impacts from solid waste generation, which includes construction and renovation debris.

(U) Water Resources

(U) Water resources analysis addresses the potential for ground-disturbing activities to harm surface water, ground water, or Wellhead Protection Areas (WHPAs).

(U) Biological Resources

(U) Existing inventories of wildlife, vegetation, and habitat types on YAB, including protected species, are reviewed in accordance with the JEGS and base *Integrated Natural Resource Management Plan* (U.S. Army Corps of Engineers [USACE], 2012), to determine if construction related to the beddown actions would result in harm due to vegetation removal or direct impact.

(U) Cultural Resources

(U) A review of existing cultural resource assets in the vicinity of the proposed facility locations is conducted in accordance with the JEGS and *Integrated Cultural Resource Management Plan* (Verhaaren, 2007) to determine if ground disturbance poses significant risk of harm to these resources.

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(U) 2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

(U) The Proposed Action is for AFSOC to base the CV-22 at YAB in order to provide enhanced capabilities to AFSOC forces in the Pacific region. The Proposed Action consists of Special Operations Squadron aircraft beddown as well as execution of related short-term and long-range actions, including conversion and renovation of existing facilities and new facility construction. This ER also includes analysis of Alternative 1, which consists of Special Operations Squadron alternate short-term facility configuration, and the No Action Alternative. Section 2.1 describes details of the Proposed Action, and Sections 2.2 and 2.3 describe Alternative 1 and the No Action Alternative, respectively.

(U) 2.1 PROPOSED ACTION

(U) The Proposed Action has two main components: (1) infrastructure projects (airfield pavement expansion and facility renovation and construction) and (2) aircraft beddown and the associated increase in personnel. Aircraft beddown would include airfield, airspace, and training operations. The programmatic requirements to support the beddown include additional airfield pavement, hangar space, operations facilities, Mobility Readiness Spares Packages (MRSP)/Peacetime Operating Stock (POS) storage, motion simulators, and construction of various other support facilities and structures.

(U) 2.1.1 Facilities Use and Construction

(U) The beddown will be accomplished through short-term and long-range actions, hereafter referred to respectively as Phase I and Phase II. Phase I would primarily involve initial use of existing facilities located on the west side of the airfield, which would be modified or renovated as necessary to support required functions, in addition to constructing a modular Squadron Operations building (Figure 2-1). Phase I would also include creating interim parking for the CV-22 at Taxiway Alpha (Figure 2-1). CV-22 parking areas would require aircraft-appropriate surface treatments, such as sodium silicate treatment and joint upgrades for all concrete exposed to exhaust heat for more than five minutes. Construction of an emergency landing pad on Taxiway Bravo as well as repair on taxiway hold locations would be required as part of Phase I. Phase I infrastructure projects are listed in Table 2-1.

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(U) Figure 2-1. Location of Phase I Infrastructure Projects, Proposed Action

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(U) Table 2-1. Phase I Proposed Action (FY 2015)

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Project Description	Work Area (SF)
Squadron Operations Building – construct new modular building near existing Building 584	N/A
Locate MRSP/Paint Composites in Building 584 (Repair)	18,900
Locate Simulator/AMU in existing Hangar 1	6,900
Locate Maintenance Hangar AMU in existing Hangar 102 (Renovate)	38,975
Create CV-22 Interim Parking (Taxiway Alpha)/Repair Apron	299,847*
Construct MSRP Exterior Covered Storage near B584	4,972
Construct Chaff and Flare Storage Facility	4,000
Construct Munitions Equipment Storage Facility	4,000
Construct O2N2 Compressor addition to B820	100
Construct Composites Maintenance Facility near B907	2,300

(U) AMU = Aircraft Maintenance Unit; MRSP = Mobility Readiness Spares Packages; N/A = not applicable; SF = square feet

(U) *Paving requirement.

(U) Long-range actions would occur in Phase II (Table 2-2). During Phase II, new facilities and structures associated with the CV-22 would be constructed on the east side of the airfield, including a three-bay hangar, squadron operations building, simulator, MRSP/POS storage, and airfield pavement (CV-22 parking areas with appropriate surface treatment). Access roads would also be constructed. The locations of Phase II projects are shown on Figure 2-2.

(U) Table 2-2. Phase II Infrastructure Projects

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Project Number	Fiscal Year	Project Description	Project Area (SF)
Phase II	2016–2020	Construct CV-22 hangar/AMU	38,204/31,755
		Construct Special Operations squadron building	20,443
		Construct CV-22 simulator	10,657
		Construct MRSP/POS storage facility	33,167
		Construct new airfield pavement	456,912
		Group Headquarters	4,597
		Bay Access airfield pavement	104,112

(U) AMU = Aircraft Maintenance Unit; MRSP = Mobility Readiness Spares Packages; POS = Peacetime Operating Stock; SF = square feet

(U) Phase II projects would affect the following existing features located west of the runway:

- (U) Two hot cargo pads
- (U) Explosive Ordnance Disposal area
- (U) Government of Japan contractor yard
- (U) A vehicle parking lot
- (U) 23 aircraft parking keyholes (Mass apron added)
- (U) Juliet Taxilane
- (U) Golf Taxilane

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(U) Figure 2-2. Location of Phase II Infrastructure Projects

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(U) Force protection measures would be incorporated in all new building construction, including structural reinforcement of walls and tempered insulated glass. All building construction would include seismic protection where appropriate. In addition, all facilities requiring fire suppression would be upgraded.

(U) 2.1.2 Aircraft Beddown and Associated Personnel Increase

(U) Beddown of the CV-22 would result in increased operations, including airfield operations, airspace operations, and munitions use. Information on increased operations was derived from interviews with AFSOC personnel.

(U) *Airfield Operations*

(U) Proposed operations will observe the current YAB quiet hours policy as reported in the 374th Airlift Wing Aircrew Guide, which states that quiet hours are from 2200 to 0600 daily, including all takeoffs, landings, and engine (not auxiliary power unit) starts unless approved by the 374th Operations Group Commander (374th Airlift Wing, 2013).

(U) *Munitions Use*

(U) As part of readiness and training operations, the aircraft would use chaff and flares and would expend 7.62-mm and .50-caliber ammunition. These items are collectively referred to as ordnance. Units would use area ranges at East Fuji Maneuver Area, Misawa Air Base (Draughon Range), Okinawa training ranges, Andersen Air Force Base, and Korea (Pil Sung Range near Osan Air Base) approved for these items. AFSOC will coordinate with the Air Force range owner regarding frequency of use and numbers of items expended.

(U) *Personnel Increase*

(U) Under the Proposed Action, there would be a total increase of 430 personnel associated with the beddown of the CV-22 (Table 2-3). The total includes civilian and military personnel. Personnel would arrive incrementally over the course of the project implementation based on force structure and strategic basing decisions.

(U) Table 2-3. Personnel Increase Under the Proposed Action

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Phase	Officer, Enlisted, Civilian	Air Force BOS	Total	Fiscal Year
Phase I and Phase II	52/337/2/391	39	430	2017-2021

BOS = Base Operations Support

(U) 2.2 ALTERNATIVE 1: SQUADRON OPERATIONS IN BUILDING 79

(U) Alternative 1 was developed in consideration of the IDP and ADP. From a mission operation standpoint, there is no difference between Alternative 1 and the Proposed Action because the number of aircraft is the same. Thus, the number of airfield operations and sorties, munitions use, and personnel increases are identical for each alternative. The difference consists

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of an alternative facility configuration for Phase I projects. Building 79 would be used for Squadron Operations, MRSP, Paint Booth, and Composites. An existing parking area would be used for functions housed in Building 79. Phase II projects would be the same as those described under the Proposed Action. The location of Phase I projects under Alternative 1 is shown on Figure 2-1. The projects are listed in Table 2-4.

(U) Table 2-4. Phase I Infrastructure Projects, Alternative 1

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Project Number	Project Description	Existing Space (SF)
4	Locate Squadron Operations and MRSP/Paint Composites in Building 79	69,726
5	Utilize parking area across the street from Building 79	N/A
6	Locate Simulator /AMU in existing Hangar 1	28,587
7	Locate Maintenance Hangar AMU in existing Hangar 102	38,975
8	Create CV-22 Interim Parking (Taxiway Alpha)	645,201*

(U) AMU = Aircraft Maintenance Unit; MRSP = Mobility Readiness Spares Packages; SF = square feet

(U) *Paving requirement.

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(U) Figure 2-3. Location of Phase I Infrastructure Projects, Alternative 1

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(U) 2.3 NO ACTION ALTERNATIVE

(U) The No Action Alternative is included as a baseline from which to compare the impacts of the Proposed Action. The No Action Alternative means that the Proposed Action would not take place and that AFSOC forces would not have access to the enhanced capabilities of the CV-22 in the YAB region. Infiltration and extraction missions would not be carried out as effectively as with the CV-22. Mission taskings would not occur within a period of darkness and would require several days to arrive at operations areas. Based on historical missions, AFSOC would also require more support aircraft than would be required if the CV-22 were used. Their missions would be somewhat limited as they would not have terrain-following capabilities and would not be able to fly under adverse weather conditions. They would not be able to self-deploy without aerial refueling, which would have an impact on mission security. The safety of the Special Forces and American citizens would be more of an issue, due to the additional time required for missions.

(U) 2.4 COMPARISON OF ALTERNATIVES

(U) Table 2-5 provides a comparison of potential effects to resources under the Proposed Action and No Action Alternative due to aircraft beddown and related construction activities.

UNCLASSIFIED**(U) Table 2-5. Proposed Action and No Action Alternative Potential Impacts**

Resource	Proposed Action	Alternative 1	No Action Alternative
Airspace	<p>With implementation of recommendations in Chapters 4 and 6, there would be no significant harm to airspace under the Proposed Action. In general, aircraft assigned to YAB would continue to use currently existing training areas and ranges.</p> <p>Beddown of the CV-22 would result in increased operations, including airfield operations, airspace operations, and munitions use.</p> <p>There would likely be minimal impact to RAPCON operations, and moderate impact to control tower operations.</p> <p>The training is not expected to significantly affect scheduling at the selected training areas.</p>	<p>There would be no significant harm to airspace under Alternative 1. From a mission operation standpoint, there is no difference between Alternative 1 and the Proposed Action. Thus, the number of airfield operations and sorties, munitions use, and personnel increases are identical for each alternative. The same recommendations identified for the Proposed Action would apply to Alternative 1.</p>	<p>There would be no significant harm to airspace due to the No Action Alternative. Under the No Action Alternative, no additional aircraft would bed down at YAB. The number of ATC operations and level of Special Use Airspace use would remain unchanged compared to current levels.</p>
Noise	<p>Flights to training areas are not expected to affect residential areas due to altitude of the aircraft.</p> <p>There would be no significant harm from construction noise from the Proposed Action. The proposed construction and renovation projects would result in minor, temporary increases in localized noise levels in the vicinity of the project areas while construction is under way.</p> <p>Increases in noise associated with the operations of the CV-22 would not result in significant harm. No significant harm resulting from noise would occur in operations within the proposed training areas.</p>	<p>There would be no significant harm from aircraft or construction noise under Alternative 1. Aircraft and construction noise impacts would be nearly the same as for the Proposed Action. The number of aircraft sorties and operations, and training areas used would be the same for the Proposed Action and Alternative 1. The location but not the intensity or characteristics of construction noise would be different under Alternative 1.</p>	<p>There would be no harm from noise under the No Action Alternative. Noise levels at YAB would remain as they are currently. No changes to aircraft operations would occur relative to existing conditions, and the proposed construction projects would not occur.</p>

UNCLASSIFIED**(U) Table 2-5. Proposed Action and No Action Alternative Potential Impacts, Cont'd**

Air Quality	No harm to air quality would occur from the implementation of the Proposed Action. Total emissions under the Proposed Action would be minimal in relation the existing context of the base and Tokyo prefecture. This would not represent a large increase over historical levels and is not considered a large quantity in the context of a heavily populated urban area.	No harm to air quality would occur from the implementation of Alternative 1. Total emissions under Alternative 1 are slightly lower than those associated with the Proposed Action and would be minimal with respect to the regional context and intensity.	Under the No Action Alternative, AFSOC would not beddown the CV-22 at YAB. As a result, there would be no additional construction or operational emissions or impacts anticipated, and emissions in the ROI would remain at or near the baseline levels.
Safety	<p>It is expected that as the CV-22 becomes more operationally mature, the aircraft mishap rate is expected to become comparable to a similarly sized helicopter aircraft with a similar mission.</p> <p>There would be no significant harm related to mishap or mishap response, operations, BASH issues, or explosives safety as a result of the CV-22 beddown.</p> <p>UXO could potentially be encountered during construction activities.</p>	<p>There would be no significant harm to safety resulting from beddown. Therefore, flight safety considerations would be the same for Alternative 1 as for the Proposed Action.</p> <p>As with the Proposed Action, UXO could potentially be encountered during construction activities.</p>	<p>Under the No Action Alternative, YAB operations would continue at the current level. No new aircraft would be introduced to the base. The existing aircraft would continue to be based at YAB, and safety conditions around the base airfield would remain unchanged. There would be no significant harm resulting from safety issues under the No Action Alternative.</p>
Transportation	<p>Overall, potential impacts would occur gradually as personnel and vehicle increases would occur over a seven-year period. The Proposed Action would not have significant harm on transportation, as road use and gate activity would continue in a safe manner.</p> <p>Ultimately, planned improvements at the north and south overruns would alleviate traffic backups.</p>	<p>Alternative 1 would be similar to the Proposed Action. Access to and from the Phase I project area would involve most of the same roads with some differences.</p> <p>Potential transportation impacts arising from Phase II activities would be the same given there are no differences in Phase II actions between Alternative 1 and the Proposed Action.</p>	<p>The No Action Alternative would have no significant harm on transportation. Traffic volume would not increase due to SOG personnel. Planned improvements as discussed in the 2012 ADP would alleviate many existing base transportation issues.</p>
Infrastructure (Utilities)	<p>No significant harm is anticipated from implementation of the Proposed Action. Water usage will create a strain on utilities until construction of a water tower for the additional storage capacity of water and to increase water pressure on the base.</p> <p>Impacts to wastewater treatment, electrical</p>	<p>No significant harm is anticipated from implementation of Alternative 1 actions concerning utilities. The difference of an alternative facility configuration for Phase I projects makes no difference in the existing capacity</p>	<p>No significant harm would occur to utility services under the No Action Alternative. Water storage capacity and pressure for fire protection would remain inadequate and continue to limit future operations and development.</p>

UNCLASSIFIED**(U) Table 2-5. Proposed Action and No Action Alternative Potential Impacts, Cont'd**

	supply, HVAC systems, communications, existing fiber optic lines, or natural gas service are not anticipated as a result of the Proposed Action.	and location water supply, wastewater treatment, electrical supply, communications, or natural gas.	
Hazardous Materials/Waste and Solid Waste	<p>With implementation of the management requirements provided under the Proposed Action, there would be no significant harm to the environment resulting from Hazardous Materials/ Waste and Solid Waste.</p> <p>During renovations, hazardous materials including asbestos, PCBs, and lead paint could potentially be encountered. 374 CES/CEIE (Environmental) would need to be involved and consulted throughout the life of the project.</p> <p>Wastes resulting from operations or other sources as well as storage and transport of these wastes would be dealt with according to the requirements of applicable YAB policies and the JEGS.</p>	<p>With implementation of the management requirements provided under the Proposed Action, there would be no significant harm to the environment resulting from Alternative 1.</p> <p>The resulting types and quantities of hazardous material, hazardous waste, and solid debris generated would be the same. All hazardous materials, waste, and debris would be managed according to the JEGS and applicable YAB plans and policies. Asbestos is known to be present in at least a portion of Building 79. If renovation activities would result in contact with asbestos, the project would be subject to the requirements of applicable YAB policies and Chapter 15 of the JEGS.</p>	<p>Under the No Action Alternative, the proposed actions would not take place. Hazardous material, hazardous waste, and solid waste generation and management would be unchanged from the current baseline conditions. There would be no significant harm to the environment resulting from the No Action Alternative.</p>
Water Resources	Water resources (surface water, groundwater or stormwater) would not be harmed at YAB as a direct or indirect impact of the Proposed Action infrastructure projects, including the repair of the Taxiway Alpha parking.	No significant harm is anticipated to YAB water resources (groundwater, surface water and stormwater) by the Alternative 1 actions, the only difference from the Proposed Action being the location of an alternate facility configuration, which is in the same vicinity of base as the Proposed Action.	No harm is expected to YAB water resources if no action is to occur. No ground-disturbing activities associated with new construction or renovations or airfield repairs would occur. The stormwater sewer system is described as satisfactory for existing conditions.
Biological Resources	There would be no significant harm to biological resources. It is not anticipated that	There would be no significant harm to biological resources under	There would be no significant harm to biological resources under the No Action

(U) Table 2-5. Proposed Action and No Action Alternative Potential Impacts, Cont'd

	<p>implementation of the Proposed Action would result in significant decreases in overall vegetation or wildlife population diversity, abundance, or fitness.</p> <p>Site surveys would be conducted before construction activities begin. Relocation of any protected plant species found would be required before initiation of ground-disturbing activities. Trees would be avoided if practicable.</p>	<p>Alternative 1. Impacts to biological resources resulting from Phase II projects would be the same as those described under the Proposed Action, as these elements are identical under each alternative. The project sites, although in a slightly different location, would still be located in the heavily developed western portion of the base. Actions would not result in significant decreases in overall vegetation or wildlife population diversity, abundance, or fitness.</p>	<p>Alternative. There would be no facilities construction, placement of new airfield pavement, or aircraft beddown. Noise levels would not change due to increased airfield operations. There would, therefore, be no impacts to vegetation or wildlife species, including protected species.</p>
Cultural Resources	<p>Implementation of the Proposed Action would potentially result in significant harm to known cultural properties. Building 102 is proposed for use as a maintenance hangar/AMU. Specific steps are required prior to adaptive reuse, such as mitigative studies and consideration of specific design elements to maintain the structure's original character.</p>	<p>Impacts under Alternative 1 would be identical to those discussed under the Proposed Action.</p>	<p>No impacts to cultural resources are anticipated under the No Action Alternative.</p>

ADP = Area Development Plan; AFSOC = Air Force Special Operations Command; AMU = Aircraft Maintenance Unit; ATC = Air Traffic Control; BASH = bird/wildlife-aircraft strike hazard; HVAC = heating/ventilation/air conditioning; JEGS = Japan Environmental Governing Standards; PCBs = polychlorinated biphenyls; ROI = region of influence; RAPCON = Radar Approach Control; SOG = Special Operations Group; YAB = Yokota Air Base

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(U) 3. AFFECTED ENVIRONMENT

(U) This chapter describes the baseline or existing conditions within the geographic areas potentially affected by the alternatives described in Chapter 2. The expected geographic area of potential impacts is known as the region of influence, or ROI. The ROI for this project is defined for each environmental resource as the outermost boundary of potential environmental consequences. The ROI is generally focused on the area around YAB and the associated airspace.

(U) 3.1 AIRSPACE

(U) 3.1.1 Definition of the Resource

(U) Airspace management and Air Traffic Control (ATC) consist of the direction, control, and coordination of flight operations in the “navigable airspace.” Navigable airspace consists of airspace above the minimum altitudes of flight prescribed by Air Force Policy Directive (AFPD) 13-2, *Air Traffic, Airfield, Airspace and Range Management*; Air Force Instruction (AFI) 13-203, *Air Traffic Control*; AFI 13-204, *Functional Management of Airfield Operations*; and AFI 13-213, *Airfield Management*. These documents provide guidance and procedures on Air Traffic Control, Airspace, Airfield Operations, and Airfield Management within the flying area. The ROI generally consists of the area around YAB and the associated airspace.

(U) Controlled Airspace

(U) Controlled airspace is categorized into five separate classes, including Classes A through E. Uncontrolled airspace designated as Class G (Figure 3-1). Classes A through E identify airspace that is controlled, airspace supporting airport operations, and designated airways. The classes also dictate pilot qualification requirements, rules of flight, and the type of equipment necessary to operate within that airspace. Airspace classifications are described below based primarily on information provided in undated guidance by the U.S. Federal Aviation Administration (FAA) and are shown graphically in Figure 3-1. Technical terms are derived from the Japan Aeronautical Information Publication (AIP) and their FAA equivalent.

(U) Class A Airspace: Class A airspace is the airspace from 18,000 feet above mean sea level (MSL) up to and including Flight Level (FL) 600. FL600 is equal to approximately 60,000 feet MSL. Flight levels are altitudes based on barometric pressure, and are therefore not necessarily equal to an aircraft’s true altitude expressed in MSL. Flight levels are expressed in terms of hundreds of feet. High altitude operations and training occur in Class A Airspace.

(U) Class B Airspace: Class B airspace begins at the land surface and extends to 10,000 feet MSL around the busiest airports in terms of airport operations or passenger enplanements. The actual configuration of Class B airspace is individually tailored and consists of a surface area and two or more layers, and is designed to contain all published instrument procedures.

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(U) Class C Airspace: Class C airspace extends from the land surface to 4,000 feet above the airport elevation (charted in MSL), surrounding those airports that have an operational control tower, are serviced by a Radar Approach Control (RAPCON), and have a certain number of instrument flight rules (IFR) operations or passenger enplanements. Although the actual configuration of Class C airspace is individually tailored, it usually consists of a surface area with a 5-NM radius, an outer circle with a 10 NM radius that extends from 1,200 feet to 4,000 feet above the airport elevation, and an outer area.



(U) **Figure 3-1. Airspace Classifications**

Source: United States Department of Transportation/FAA, 2003

(U) Class D Airspace: Class D airspace, also known as Class D Surface Area, extends from the surface to 2,500 feet above the airport elevation (charted in MSL), surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored, and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be designated as Class D or Class E airspace.

(U) Class E Airspace: Class E airspace is controlled airspace that is not Class A, B, C, or D. Class E airspace extends upward from either the surface or another designated altitude (generally 700 or 1,200 feet above ground level [AGL]), to the overlying or adjacent airspace. This airspace class includes Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to and from the terminal or en route environment, and en route domestic and offshore airspace areas below 18,000 feet mean sea level (MSL).

(U) Uncontrolled Airspace

(U) Class G Airspace: Class G airspace (uncontrolled airspace) generally underlies Class E airspace, with vertical limits up to 700 feet AGL, 1,200 feet AGL, or other altitudes as applicable. There are typically visual flight rules (VFR) in effect. Cloud clearance and visibility requirements differ by altitude and time of day.

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(U) Special Use Airspace

(U) Special use airspace is defined as airspace in which certain activities must be confined, or where limitations may be imposed on aircraft operations that are not part of those activities (FAA, undated). Special use airspace may consist of the following categories.

- **(U) Prohibited Areas** contain airspace within which aircraft flight is prohibited. Such areas may be established for security or other reasons. These areas are published on aeronautical charts.
- **(U) Restricted Areas** exist where operations are hazardous and where operation of nonparticipating aircraft, while not prohibited, is subject to restrictions. The hazards are typically unusual and may be difficult to see from the aircraft (e.g., military gunnery training).
- **(U) Warning Areas** are similar to Restricted Areas, but differ in that the U.S. government does not have sole jurisdiction. Warning areas may be located over domestic or international waters.
- **(U) Military Operating Areas** refer to defined airspace limits established to separate military training activities from IFR traffic.
- **(U) Alert Areas** are established to inform nonparticipating pilots of areas that may contain a high volume of pilot training or other type of unusual activity.
- **(U) Controlled Firing Areas** support hazardous activities that must be suspended if a spotter aircraft, radar, or ground lookout indicates a nonparticipating aircraft could be approaching.

(U) 3.1.2 Existing Conditions

(U) Airfield Area and Location

(U) YAB is located on the Island of Honshu, 28 miles west of the center of Tokyo and 38 miles northeast of Mt. Fuji. Japan is a mountainous area. Terrain and other obstructions rise to 800 feet above airfield elevation within 5 NM of the airfield. Generally flat terrain occurs to the northeast and south, with extensive urban buildup in the Kanto Plain area. The minimum safe altitude within 25 NM of YAB is 9,500 feet MSL to the west, and 3,000 feet MSL to the east. The emergency safe altitude within 100 NM of YAB is 15,000 feet MSL.

(U) Airfield Operating Hours

(U) The Yokota Aerodrome (aerodromes consist of airports, airfields, or water takeoff/landing areas) and 374th Operations Support Squadron (OSS) Weather Flight operate from 0600 to 2200, 365 days per year, unless closed due to a Notice to Airmen. Yokota RAPCON is open 24 hours per day, seven days per week. Tower personnel report for duty 30 minutes prior to aerodrome opening and Airspace Management (AM) Operations reports for duty one hour prior to opening to conduct pre-opening activities. Control Tower, AM Operations, and OSS Weather Flight personnel are on call for pre-coordinated departures and

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arrivals outside of normal operating hours. The on-duty RAPCON Watch Supervisor is responsible for notifying on-call personnel.

(U) Runways

(U) YAB's single runway, designated 18/36, is a grooved concrete runway that is 11,000 feet long and 200 feet wide. The magnetic bearings are 177.29°/357.29° and true bearings are 170.3°/350.3°. Coordinates are 35° 44.55' N 139° 20.55' E. Airfield elevation is 463 feet MSL. The north and south overruns are 1,000 feet long and 200 feet wide and are constructed of 1.5-inch asphalt. Perimeter roads cross the south overrun 300 feet from the threshold, and cross the north overrun 600 feet from the threshold. Both perimeter roads are controlled by stop lights and warning bells operated by Tower personnel.

(U) Yokota Control Zone

(U) Yokota Control Zone is the airspace from the surface up to (but not including) 3,000 feet MSL within a five NM radius of the center of the aerodrome, excluding the area one NM east of Runway 18/36 centerline. Yokota Control Tower retains responsibility for ATC within this airspace when open.

(U) Adjacent Airfields and Control Zones

(U) In addition to YAB, several other airfields and control zones occur in the ROI. These areas are briefly described below and shown on Figure 3-2.

(U) **Iruma Control Zone.** Iruma airfield is a Japan Air Self-Defense Force (JASDF) airfield located northeast of YAB. Iruma hosts a mixed mission inventory of aircraft.

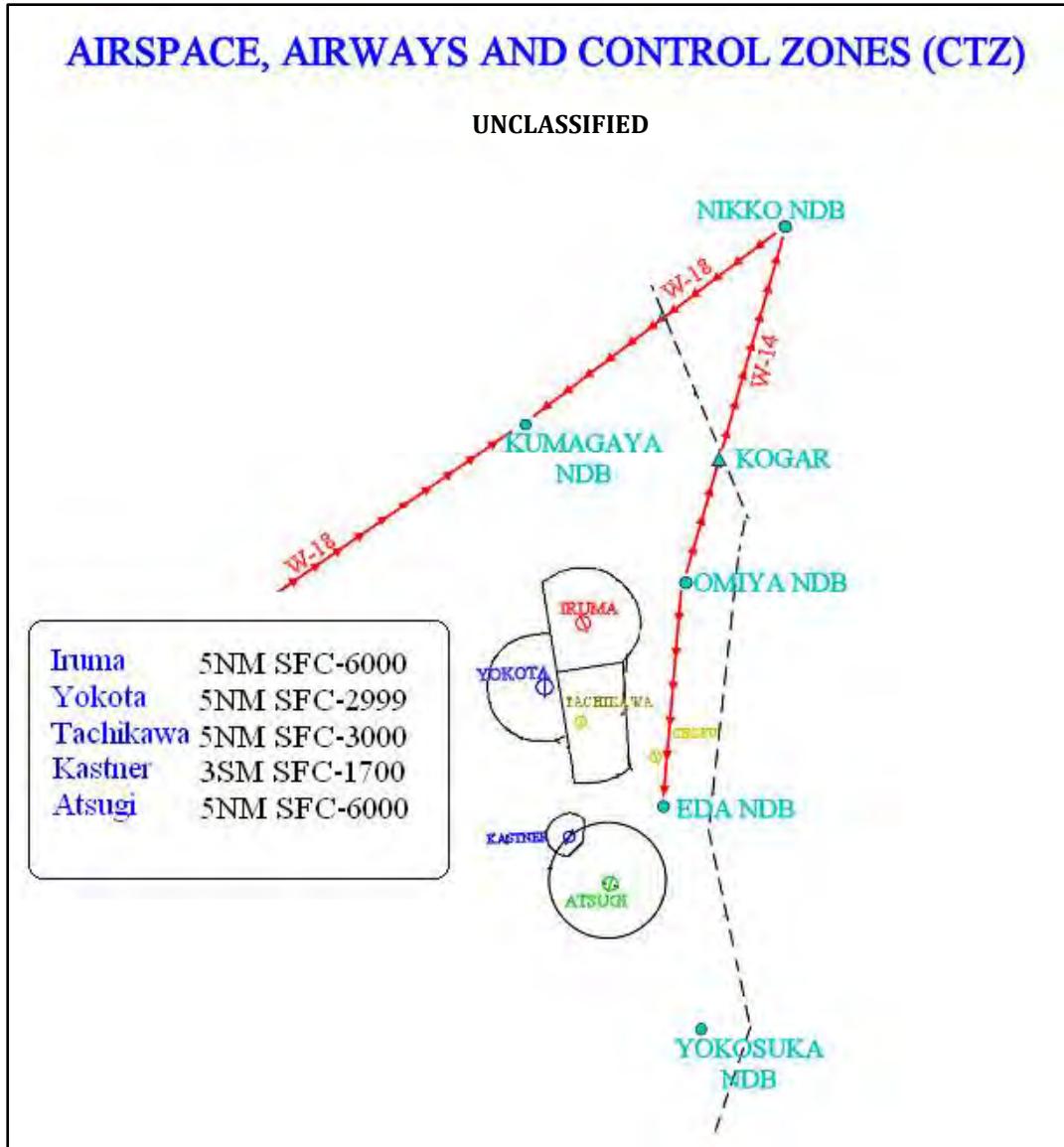
(U) **Tachikawa Control Zone.** Tachikawa airfield is a Japan Ground Self-Defense Force (JGSDF) airfield located east-southeast of YAB. The primary aircraft based at Tachikawa are UH-1J helicopters, although various other Japanese national and local government aircraft are operated as well.

(U) **Atsugi Control Zone.** Atsugi is a Japan Maritime Self-Defense Force (JMSDF) airfield located south-southeast of YAB. Major flying units assigned include U.S. Navy Carrier Wing Five (CVW-5) and JMSDF Fleet Air Force.

(U) **Kastner Control Zone.** Kastner Army Airfield (airport) is a U.S. Army airfield located near Camp Zama, south of YAB. UH-60 helicopters are the primary aircraft operated at and in the vicinity of Kastner.

(U) **Chofu Airport.** Chofu airport is an uncontrolled airport and has no controlled airspace. Operations consist primarily of civilian private and commercial pilots operating under VFR.

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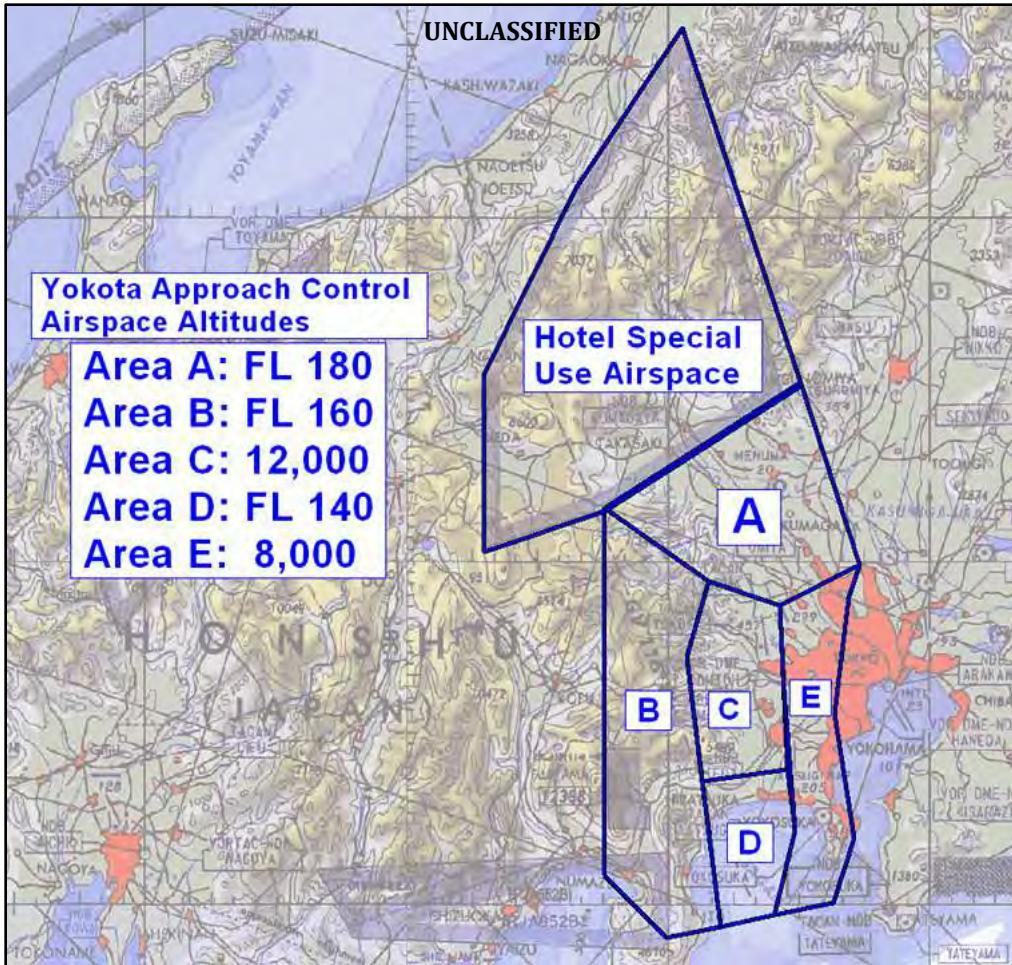


(U) Figure 3-2. Yokota Air Base Airspace, Airways, and Control Zones

(U) Yokota RAPCON Airspace Airways

(U) The Yokota RAPCON airspace is shown in Figure 3-3. Segments of two Japanese airways transit the airspace controlled by Yokota RAPCON: W-14 and W-18. The W-14 airway begins at waypoint RB (Eda) and terminates at JD (Nikko NDB). The segment of this airway occurring within the Yokota RAPCON airspace is delineated by points RB and KOGAR. Minimum Enroute Altitude (MEA) for this segment is 4,000 feet MSL (KOGAR to MI [Omiya]) and 3,000 feet MSL (MI [Omiya] to RB [Eda]). The W-18 airway begins at GOC (Daigo VORTAC) and terminates at KCC (Nagoya VORTAC). The segment of this airway within Yokota RAPCON airspace is HATAR to TAKNE. MEA for this segment is 5,000 feet MSL (JD to AY) and FL150 (AY to TAKNE).

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(U) Figure 3-3. Yokota Air Base Radar Approach Control Airspace

(U) Terminal Traffic Patterns

(U) Four terminal traffic patterns are established near YAB and are described below. VFR rectangular and overhead patterns are shown on Figure 3-4.

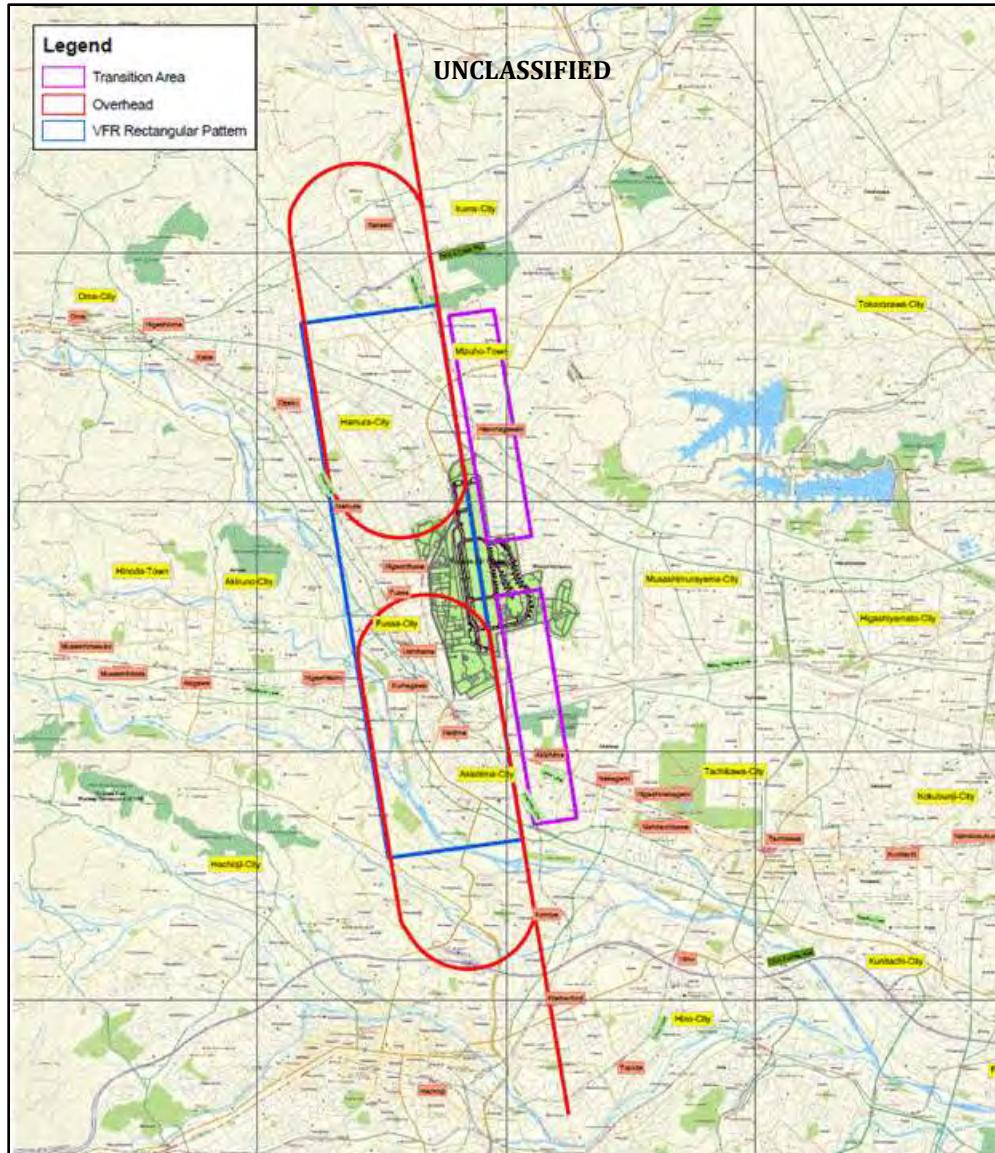
(U) **VFR Rectangular Pattern.** YAB has west rectangular patterns at 2,000 feet MSL and 1,500 feet MSL.

(U) **VFR Overhead Pattern.** YAB has west overhead patterns at 2,500 feet MSL. The initial overhead pattern for Runway 18 occurs south of Hanno City at a prominent ridge of hills located 3 NM north of YAB (YOK R357/3.5). The initial overhead pattern for Runway 36 is located 3 NM south of YAB (2 NM north of Hachioji) (YOK R177/4.5).

(U) **Radar Rectangular Pattern.** The YAB radar traffic pattern is delineated by an east rectangular pattern extending 13 NM crosswind/north of base, 6 NM downwind to the east, and downwind/base turned at a point 13 NM southeast. The pattern altitude is 4,000 feet MSL.

(U) **Helicopter Transition Pattern.** The helicopter pattern altitude is 1,500 feet MSL.

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(U) Figure 3-4. Yokota Air Base Terminal Traffic Patterns

(U) 3.2 NOISE

(U) 3.2.1 Definition of the Resource

(U) Noise is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Noise has the potential to impact several environmental resource areas. This section describes baseline noise conditions and noise effects on human annoyance and health, as well as structures. Noise impacts on biological, socioeconomic, and cultural resources are discussed in separate sections dealing with those environmental resources. The ROI for noise consists of lands in the vicinity of YAB and lands beneath or near the existing training areas and airspace proposed for use.

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(U) Noise can be of several different types, each of which has its own characteristics. Continuous noise sources include machinery, such as a generator on a construction site. Transient noise sources are those that move through the environment, either along established paths (e.g., highways or railroads) or semi-randomly (e.g., training in a low-level training area). Some noise sources are impulsive (e.g., thunder clap or sonic boom). The response of a receptor (e.g., person, animal, or structure) to a noise depends on the characteristics of the noise itself as well as the sensitivity of the receptor at the time the noise is heard.

(U) The physical characteristics of sound include intensity, frequency, and duration.

(U) **Intensity**

(U) Sound consists of minute pressure waves that travel from the sound source to the ear. These waves can be compared to ripples spreading outward from a stone dropped in still water. Larger waves are interpreted by the ear as more intense sounds. Sound intensities are expressed using the logarithmic unit, the decibel (dB). Each 10-dB increase represents a tenfold increase in intensity. Thus, for example, a 30-dB increase represents a thousand-fold increase in sound intensity. A whisper is typically considered to be 20 dB or lower, while a thunderclap can be 120 dB or louder.

(U) **Frequency**

(U) The frequency of a sound, as measured with the unit Hertz (Hz) is the number of sound waves that pass a stationary point per second. A person with healthy hearing can detect sounds ranging from approximately 20 Hz to 15,000 Hz, but hearing is typically most acute in the middle frequencies of this range (about 1,000 to 4,000 Hz). Sound measurements related to human hearing are therefore often refined using “A-weighting,” which emphasizes frequencies best heard by the human ear. In this ER, dB is A-weighted unless otherwise noted.

(U) **Duration**

(U) The duration of a noise event is the time between initially hearing the sound and the sound no longer being heard. From the ground, the sound level of an aircraft flying overhead changes continuously, starting at the ambient (background) level, increasing to a maximum as the aircraft passes closest to the receiver, and then decreasing to ambient as the aircraft moves into the distance.

(U) Noise analysts use several metrics that describe complex and variable sets of noise events. These metrics are designed to represent noise in such a way that noise impacts can be predicted. Noise metrics used in this analysis include the following:

- (U) *Sound exposure level (SEL)* accounts for the maximum sound level and the length of time a sound lasts. SEL does not directly represent the sound level heard at any given time. Rather, it provides a measure of the total sound exposure for an entire event. For many types of noise impacts, SEL provides a better measure of intrusiveness of the sound than the maximum noise level alone (L_{max}).
- (U) *Day-Evening-Night Equivalent Level (L_{den})* is a noise metric combining the levels and durations of noise events and the number of events over a 24-hour period. L_{den} also

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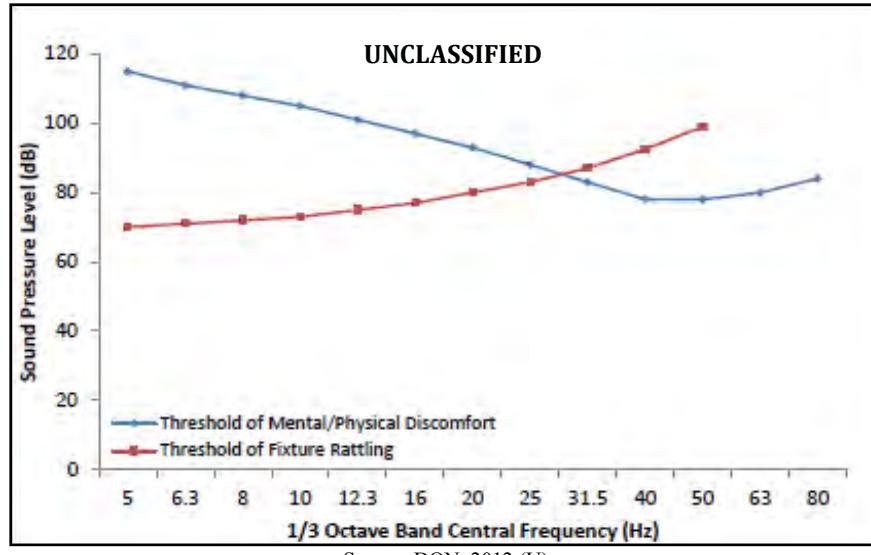
accounts for more intrusive evening and night time noise, adding a 5-dB penalty for sounds in the time period 1900 hrs to 2200 hrs and a 10-dB penalty for sounds in the time period 2200 hrs to 0700 hrs. This metric is the same as the Community Noise Equivalent Level (CNEL) used in the state of California, U.S.A. CNEL/L_{den} are the same as the noise metric L_{dn} except that L_{dn} does not add a penalty for evening operations. All three metrics can be used as predictors of the likelihood of annoyance due to noise. The Japanese government transitioned from using the Weighted Effective Perceived Noise Level as primary noise index to the L_{den} in April 2013 (Narita International Airport, 2013). In this ER, CNEL is computed for operations representing an average annual day (AAD), which includes 1/365th of total annual operations.

- (U) *Noise level exceeded (L_x)* reflects the noise level exceeded during a stated percentage of the time period studied. For example, the L₉₀ metric reflects the noise level exceeded during 90 percent of the period studied. This metric provides an indication of the range of noise levels experienced in a location.
- (U) *Peak sound level as measured in decibels (L_{pk})* is used to characterize the strength of impulsive noise such as gunfire.

(U) Typical outdoor day-night sound levels in an urban environment range from approximately 60 to 70 dB, but can reach 80 dB or higher (U.S. Environmental Protection Agency [USEPA], 1974). Sound levels in quiet suburban settings typically range from around 45 to 50 dB. Sound levels of 40 to 70 dB may be encountered inside residences, depending on the specific activities taking place (e.g., conversations, stereo music).

(U) The use of A-weighted sound levels in this document is consistent with other DoD analyses of noise sources similar to that produced by the CV-22. A-weighting minimizes the contribution of high and low frequency sounds in the upper and lower regions of typical human hearing ability. However, the Government of Japan, through the Okinawa Defense Bureau (ODB), has also specifically evaluated low-frequency noise (LFN) (frequencies below 80 Hz) produced by helicopters and the MV-22 (Marine Corps variant of the CV-22). LFN is generally not attenuated by the atmosphere or structures as well as noise of higher frequencies. LFN travels comparatively farther from the source and is often the cause of structural vibrations. Fixed-wing aircraft produce the highest levels of LFN during takeoff roll, runway acceleration, and thrust reversal during landing. Rotary-wing aircraft produce the highest levels during vertical takeoff/landing and while hovering. Annoyance and a variety of physical effects resulting from LFN exposure have been suggested, although some of these assertions are controversial. The ODB produced threshold curves for frequencies between 5 and 80 Hz (human discomfort) and 5 and 50 Hz (structural effects) (Figure 3-5). Thresholds ranged from 65 to nearly 120 dB. It was noted, however, that the thresholds were developed in relation to stationary long-duration noise, not transitory noise such as that produced by moving aircraft.

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(U) Figure 3-5. Low-Frequency Noise Effects Thresholds Developed by the Okinawa Defense Bureau

(U) Japan has implemented a number of measures to decrease the effects of aircraft noise on human populations, including operational restrictions, use of quieter aircraft, noise monitoring, and mitigation techniques. For areas that continue to be impacted, the government may implement further measures in accordance with the Aircraft Noise Prevention Law (Ministry of Land, Infrastructure, Transport and Tourism [MLIT], 2012). These measures are categorized by classes based upon dB levels received and include assistance for soundproof construction of educational facilities and houses, relocation compensation, and construction of green buffer zones. The Ministry of Environment (2012a) has established desired noise levels as not exceeding 62 dB L_{den} in Category I areas and 66 dB L_{den} in Category II areas. Category I areas are those used exclusively for residential purposes, while Category II refers to other types of areas.

(U) 3.2.2 Existing Conditions

(U) Airfields

(U) Noise from airfield operations dominates the sound environment in nearby areas. Noise levels generated by several currently based aircraft types are listed in Table 3-1. All aircraft noise levels shown in the table reflect the aircraft in a typical takeoff configuration to allow for comparison between aircraft. Actual aircraft configurations vary throughout arrivals, departures, and closed patterns.

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(U) Table 3-1. Noise Levels (dB SEL) Associated With Direct Overflight of Based Aircraft

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Aircraft Type	Airspeed (knots)	Power Setting	Altitude (Feet AGL)			
			500	1,000	2,000	5,000
C-130H+P	170	970 CTIT	97	91	86	77
C-12	160	100 % RPM	84	79	75	68
H-1	80	80 KTS	96	91	87	79

(U) CTIT = Turbine Inlet Temperature, in degrees Celsius; RPM = revolutions per minute; 80 KTS = Engine collective required to fly the aircraft at 80 knots; SEL = sound exposure level

(U) Notes: SEL was calculated under standard acoustic atmospheric conditions (59°F and 70 percent relative humidity) using the program SELCALC.

(U) Noise analysis was conducted at several known particularly noise-sensitive locations near the installation using the suite of computer programs collectively known as NOISEMAP. Detailed information on flying operations and aircraft ground operations were entered into NOISEMAP which then calculated noise levels near the installation. Noise levels at these noise-sensitive locations are reported using the noise metric SEL in Table 3-2. Presentation of these representative locations is not intended to imply that other locations not listed are not noise-sensitive.

(U) Table 3-2. Noise Levels at Representative Noise-Sensitive Locations

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ID #	General Description ¹	Latitude	Longitude	Highest SEL ²
1	Factory	35° 47'30.62 N	139° 20'35.71 E	112
2	Mizuho Nagaoka Hall	35° 46'58.79 N	139° 19'50.14 E	101
3	Agricultural Cooperative Mizuho Store	35° 46'37.5 N	139° 20'28.07 E	120
4	Hamura Daini Junior High School	35° 46'1.91 N	139° 19'17.69 E	93
5	Fussa Daini Junior High School	35° 35'1.30 N	139° 19'40.17 E	99
6	Musashimurayama Daini Elderly Welfare Hall	35° 44'58.89 N	139° 22'13.35 E	97
7	Fussa Daigo Elementary School	35° 43'33.36 N	139° 19'44.32 E	93
8	Nishisuna Elementary School	35° 43'37.77 N	139° 21'59.96 E	99
9	Akishima Observation Well	35° 43'17.1 N	139° 21'22.58 E	117
10	Akishima City Hall	35° 42'17.36 N	139° 21'18.03 E	113
11	Nakagami Elementary School	35° 42'11.22 N	139° 22'11.32 E	100
12	Ishikawa Community Center	35° 40'42.8 N	139° 22'5.10 E	112
13	Owada Community Center	35° 39'31.92 N	139° 21'8.46 E	96
14	Tokyo New Town Development	35° 39'42.72 N	139° 22'32.42 E	109
15	Takai Elementary School	35° 38'25.78 N	139° 22'29.50 E	107
16	Tokyo Metropolitan University	35° 36'51.29 N	139° 22'55.60 E	102

(U) dB = decibel; E = East; N = North; SEL = sound exposure level

(U) 1. Specific points are at the approximate location of the facility listed.

(U) 2. "Highest SEL" is the highest SEL generated by any representative flight profiles used in noise modeling. Actual flight profiles may deviate from representative flight profiles used and SEL noise levels experienced at the listed locations may exceed the value listed.

(U) Units based at YAB have implemented several noise abatement procedures to reduce noise impacts on the surrounding communities. During quiet hours, which begin at 2200 hrs and

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continue until 600 hrs daily, all takeoffs, landings, and engine starts require Operations Group Commander approval. Operations during this time are limited to mission-essential missions only and landings during these hours are limited to a single approach to a full-stop only (e.g., no practice airfield approaches). Multiple approaches to the runway are also not permitted between 1800 hrs on Friday and 600hrs on Monday. Multiple approaches conducted under VFR, which are often repeated several times during a single sortie, are not permitted during the following time periods: 645 hrs to 745 hrs, 1145 hrs to 1245 hrs, and 1630 hrs to 1730 hrs except for aircraft crossing the runway threshold at greater than 1,000 feet MSL. Aircraft crossing the threshold at greater than 1,000 feet MSL are not permitted to conduct touch-and-go landings. Pilots are instructed to minimize use of reverse thrust between the hours of 2100 hrs and 700hrs while slowing the aircraft during landing ground roll. Pilots are further instructed to shut down a symmetrical engine pair after leaving the runway on arrival and to use low-speed ground idle engine power whenever practicable to reduce noise. Several avoidance areas have been established in the vicinity of YAB to reduce noise or other disruptions caused by aircraft operations.

(U) Training Areas

The ROI includes several existing training airspace units, landing zones/drop zones, and munitions training ranges including CATC Camp Fuji, the “Hotel” Training Area, Draughon Range, existing Okinawa training ranges. These training areas are located primarily in rural areas, where ambient noise levels are typically low. A study conducted by the USEPA found that noise levels on a farm are typically in the range of 35 dB L₉₀ to 44 dB L₁₀ (USEPA, 1974). More densely populated areas typically experience higher noise levels. The training locations proposed for use by the CV-22 are currently used for military training and experience aircraft overflight and gunnery training noise on a regular basis. Japan has established flight procedures to minimize military aircraft noise impacts, including establishing several avoidance areas.

(U) 3.3 AIR QUALITY

(U) Identifying the affected area for an air quality assessment requires knowledge of sources of air emissions, pollutant types, emission rates, release parameters, proximity to other emissions sources, and local conditions.

(U) 3.3.1 Definition of the Resource

(U) Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. YAB has a moderate climate comparable to the weather in the mid-Atlantic states, with an annual average atmospheric high temperature of 67.25°F, annual average atmospheric low temperature of 45.65°F, and 54.0 inches of rain annually (World Weather Online, 2014). Most of the rainfall occurs during the wet season (early June to mid-July) and from typhoons, which occur most frequently from July to November. Prevailing winds in spring and summer are southerly, creating warm moist conditions which result in an increased number of days with haze and fog. Prevailing winds are out of the north during autumn and winter, resulting in clear skies and stable conditions (Windfinder, 2014).

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(U) 3.3.2 Existing Conditions

(U) Baseline Air Quality

(U) The AEI estimates criteria pollutant emissions from stationary sources as defined in Title I of the Clean Air Act (Title 42 United States Code, Chapter 85). These pollutants include carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter with an aerodynamic diameter less than 10 microns (PM₁₀), oxides of sulfur (SO_x), and volatile organic compounds (VOC). YAB only collects data and prepares an AEI for stationary sources. Mobile sources combust fuel and therefore emit quantities of the criteria pollutants. Mobile emission sources at YAB include aircraft sorties for based and transient (non-based) aircraft, on-wing aircraft engine testing, aerospace ground support equipment (AGE), government-owned vehicles (GOVs), privately owned vehicles (POVs), and non-road vehicles/non-vehicular equipment (NR/NV). YAB does not collect data or prepare a mobile source AEI. In addition, no regional air emissions data for Tokyo prefecture was available. Table 3-3 shows the baseline stationary source emissions for YAB.

(U) Table 3-3. Stationary Source Emissions Inventory for Yokota Air Base

Source Type	Emissions (tons/year)				
	CO	NO _x	PM ₁₀	SO _x	VOC
	33.64	135.83	7.5	46.53	13.41
Totals	1,370.34	549.03	180.32	107.33	213.08

(U) CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than 10 microns in diameter; SO_x = sulfur oxides; VOC = volatile organic compounds

(U) Source: ESOH, 2012

(U) Regulatory Setting

(U) Air quality standards are governed under the JEGS. The JEGS are intended to ensure DoD activities and installations in Japan protect human health and the natural environment through the promulgation of specific environmental compliance criteria. The JEGS provide specific equipment standards and reporting requirements for the following equipment: steam and hot water generating units, incinerators, chromium electroplating and chromium anodizing tanks, halogenated solvent cleaning machines, units containing ozone-depleting substances (ODS), and motor vehicles. Additionally, the JEGS address open burning (U.S. Forces Japan, 2012).

(U) 3.4 SAFETY

(U) 3.4.1 Definition of the Resource

(U) This section addresses flight safety and ground safety associated with operations conducted within the existing airspace. Training operations would be conducted in military training airspace. Flight safety considers aircraft flight risks. The ROI for safety is the base and surrounding airspace.

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(U) 3.4.2 Mishap and Event Classifications

(U) Classify mishaps by total direct mishap cost and the severity of injury/occupational illness. On initial response, use the highest reasonably-expected cost estimate to determine the mishap class and downgrade if additional cost information indicates a lower class is warranted. Note: Severity of injury/occupational illness, not injury/occupational cost, is used to classify mishaps.

(U) Class A Mishap. A mishap resulting in one or more of the following:

- (U) Direct mishap cost totaling \$2,000,000 or more.
- (U) A fatality or permanent total disability.
- (U) Destruction of a DoD aircraft.
- (U) Permanent loss of primary mission capability of a space vehicle.

(U) Class B Mishap. A mishap resulting in one or more of the following:

- (U) Direct mishap cost totaling \$500,000 or more but less than \$2,000,000.
- (U) A permanent partial disability.
- (U) Inpatient hospitalization of three or more personnel. Do not count or include individuals hospitalized for observation, diagnostic, or administrative purposes that were treated and released.
- (U) Permanent degradation of primary or secondary mission capability of a space vehicle or the permanent loss of secondary mission capability of a space vehicle.

(U) Class C Mishap. A mishap resulting in one or more of the following:

- (U) Direct mishap cost totaling \$50,000 or more but less than \$500,000.
- (U) Any injury or occupational illness that causes loss of one or more days away from work not including the day or shift it occurred. When determining if the mishap is a Lost Time Case, you must count the number of days the employee was unable to work as a result of the injury or illness, regardless of whether the person was scheduled to work on those days. Weekend days, holidays, vacation days, or other days off are included in AFI91-204, 12 February 2014.
- (U) An occupational injury or illness resulting in permanent change of job.
- (U) Permanent loss or degradation of tertiary mission capability of a space vehicle.

(U) Class D Mishap. A mishap resulting in one or more of the following:

- (U) Direct mishap cost totaling \$20,000 or more but less than \$50,000.
- (U) Any mishap resulting in a recordable injury or illness not otherwise classified as a Class A, B, or C mishap. These are cases where, because of injury or occupational illness, the employee only works partial days, has restricted duties (does not include medical restriction from flying or special operational duties (DNIF) by AF Form 1042) or was transferred to another job, required medical treatment greater than first aid, or experienced loss of consciousness (does not include GLOC). In addition, a significant injury (e.g. fractured/cracked bone, punctured eardrum) or occupational illness (e.g. occupational cancer (mesothelioma), chronic irreversible disease (beryllium disease))

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diagnosed by a physician or other licensed health care professional must be reported even if it does not result in death, days away from work, restricted work, job transfer, medical treatment greater than first aid, or loss of consciousness.

(U) 3.4.3 Existing Conditions

(U) This section addresses flight safety, ground safety, and use of chaff and flares. Flight safety includes mishap rates and wildlife strike hazards. Ground safety includes explosives safety, accident potential zones, and unexploded ordnance (UXO).

(U) Flight Safety

(U) One concern with regard to flight safety is the potential for aircraft accidents, which are generally called mishaps. Mishaps may occur as a result of weather conditions, mechanical failure, pilot error, mid-air collisions, collisions with manmade structures or terrain, or bird-aircraft collisions. These types of flight safety risks apply to all aircraft; they are not limited to military aircraft.

(U) It is difficult to predict the precise location of a potential aircraft accident. Improved system awareness and sensing capabilities installed on military aircraft for combat have the benefit of improved tracking and avoidance of light aircraft. Should an accident occur, the major consideration is loss of life (military and civilian), followed by property damage. The aircrew's ability to exit from a malfunctioning aircraft depends on the type of malfunction encountered. The probability of an aircraft crashing into a populated area is extremely low, but cannot be totally discounted. Several factors are relevant to the secondary effects of an aircraft crash, including the potential for fire or environmental contamination. Because the extent of these secondary effects is situationally dependent, they are difficult to quantify. A crash of any aircraft can cause damage and/or loss of life. Environmental factors can potentially affect the results of a crash. For example, if a mishap occurred in highly vegetated areas during hot, dry weather, the risk of extensive fire would be higher than that associated with a mishap in more barren or rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. The petroleum, oils, and lubricants not consumed in a fire could contaminate soil and water. The potential for contamination depends on several factors. The porosity of the surface soils determine how rapidly contaminants are absorbed. The specific geologic structure in the region will determine the extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area will also affect the extent of contamination to those resources.

(U) Yokota Air Base

(U) There is an established process for local citizens to pursue claims for damages that result from Air Force training activities. This process is initiated through contact with a base's Public Affairs Office. Mishap response typically occurs through an initial response followed by an

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investigation. The initial response focuses on rescue, evacuation, fire suppression, safety, elimination of explosive devices, ensuring security of the area and conducting other immediate actions necessary to prevent loss of life or further property damage. The initial response elements consist of responsible personnel and agencies, including the fire chief (who is usually the first on-scene commander), firefighting and crash rescue personnel, medical personnel, security police, and crash recovery personnel. Subsequent response teams are composed of an array of organizations whose participation is governed by the circumstances associated with the mishap and actions required to be performed.

(U) The investigation phase is accomplished next. The Air Force has no specific rights or jurisdiction just because a military aircraft is involved. Regardless of the agency initially responding to the accident, efforts are directed at stabilizing the situation and minimizing further damage. The landowner or land managing agency would be informed of the incident. Base environmental and security personnel work together with land owners or managing agency to identify, isolate, and clean up any contaminating materials. After all required actions on the site are complete, the aircraft and debris are removed. After a Class A mishap, the Air Force makes every effort to locate, document, and then remove debris resulting from the accident. Documenting debris helps to reconstruct the cause of the accident and to restore the accident site as much as possible. Depending on the extent of damage, only the largest pieces of debris may be located and removed from a crash site.

(U) ***Wildlife Strike Hazard***

(U) Bird-aircraft strikes constitute a safety concern because they can result in damage to aircraft or injury to aircrews or local populations if an aircraft crashes. Although aircraft may encounter birds at altitudes up to 30,000 feet MSL or higher (FAA, 2013), most birds fly relatively close to the ground. Most bird strikes involving commercial aircraft occur at altitudes below 500 feet. While any bird-aircraft strike has the potential to be serious, many result in little to no damage to the aircraft, and only a minute portion result in a Class A mishap.

(U) The base's *Bird Aircraft Strike Hazard (BASH) Plan* (YAB, 2012b) describes bird and wildlife threats at the installation. Bird hazards exist on the airfield year round, but bird activity is elevated between the months of April and October. Bird activity is usually highest in September and October. Although several types of birds may occur near the airfield, raptors and crows are considered to be of greatest concern. Raptors (hawks and kites) frequently circle the airfield while hunting, with peak activity at mid-day (1000 through 1400 hours). Crows often transit the runway while moving between the east incinerator and the western portion of the base, with increased movement in early morning and late afternoon. Other types of birds that may pose a threat to aircraft include pheasants, starlings, swallows, doves, and pigeons. Foxes and domestic animals may pose a threat if they move onto the runway. Although Japan lies within a

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major East Asian Flyway, migratory birds typically do not occur in substantial numbers on the installation.

(U) The BASH Plan also describes existing procedures and requirements that are in place to manage threats presented by birds and wildlife. Personnel at the Operations Support Squadron Tower (374 OSS/OSAT) are the primary means of providing notification of hazardous bird activity. The Tower broadcasts Bird Watch Conditions (BWC) on Automatic Terminal Information Service (ATIS). RAPCON (374 OSS/OSAR) may also issue BWC to arriving aircraft when advised by Tower that ATIS is out of service, or when pilots advise they are unable to receive ATIS. In addition, BWC can be found in the Flight Information Handbook. BWC are categorized as Severe, Moderate, or Low. Severe conditions are defined as bird activity on or immediately above the active runway or other specific locations representing a high potential for strikes. With the possible exception of emergency aircraft, all takeoffs, landings, and approaches are prohibited unless the Operations Group Commander (or higher) grants approval. Moderate conditions are defined as bird activity in locations representing increased potential for strikes. Multiple approaches are prohibited during Moderate conditions. Only initial takeoffs and full stop landings are allowed. Low conditions signify normal bird activity with a low probability of hazard.

(U) YAB reported 55 bird strikes between FY2008 and FY2013 (as of the time of preparation of this ER). Species involved in the strikes were not provided. Eighty percent of the total strikes occurred during the timeframe of June to November, with the greatest number occurring in September. The BASH Plan also describes various bird-reduction techniques used at the base, including land management practices, habitat elimination, scare tactics (pyrotechnic munitions, gas canons), and depredation.

(U) Ground Safety

(U) Day-to-day operations and maintenance activities at YAB are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements. The 374th Civil Engineer Squadron Fire Department meets all established Air Force staffing and equipment standards. If extraordinary requirements occur, such as those possible with a large fire or earthquake that threatens civilian as well as base personnel, the YAB Fire Department has established cooperative response actions with local fire departments from Fussa City, Hamura City, Mizuho Town, and other organizations. Other ground safety issues include explosives safety, accident potential zones, UXO, and ground response to aircraft mishaps.

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(U) *Explosives Safety*

(U) Defense Department Explosives Safety Board (DDESB) 6055.9-Standard and Air Force Manual 91-201, *Explosives Safety Standards*, represent DoD and the Air Force guidelines for complying with explosives safety. These regulations, as well as AFI 91-204, *Safety Investigations and Reports*, identify explosives safety mishaps involving explosive and chemical agents. Explosives include ammunition, propellants (solid and liquid), pyrotechnics, warheads, explosive devices, and chemical agent substances and associated components that present real or potential hazards to life, property, or the environment.

(U) Siting requirements for munitions and ammunition storage and handling facilities are based on safety and security criteria. Defined distances are maintained between munitions storage areas and a variety of other types of facilities. These distances, called quantity distance (QD) arcs, are determined by the type and quantity of explosive material to be stored. Each explosive material storage or handling facility has QD arcs extending outward from its sides and corners for a prescribed distance. QD arc areas on YAB are shown in Figure 3-6. Within these QD arcs, development is either restricted or prohibited altogether in order to ensure personnel safety and to minimize potential for damage to other facilities in the event of an accident. In addition, explosives storage and handling facilities must be located in areas where security of the munitions can be maintained at all times. Identifying the QD arcs ensures that construction does not occur within these areas.

(U) YAB controls, maintains, and stores all ordnance and munitions required for mission performance in accordance with Air Force and DDESB safety procedures. All munitions maintenance is carried out by trained, qualified personnel using Air Force-approved technical data for the specific type of ordnance. Storage facilities are fully certified for the ordnance they store. The Air Force imposes procedures for arming and de-arming munitions and ordnance. All such activities occur on defined arm/de-arm pads. Air Force and DDESB safety procedures require safeguards on weapons systems and ordnance that ensure against inadvertent releases.

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(U) Figure 3-6. Quantity-Distance Arcs on Yokota Air Base

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(U) *Use of Chaff and Flares*

(U) Chaff and flares are defensive countermeasures used to defend against air- or ground-based threats. Chaff, which consists of bundles of extremely small strands of aluminum-coated silica fibers, is designed to briefly confuse opposition radar and permit a pilot to maneuver to avoid the threat. Flares are used to attract enemy heat-seeking missiles and lead them away from the targeted aircraft. Flares used in defensive training burn out within approximately 400 feet of deployment altitude, and would not be deployed below 5,000 feet MSL (approximately 4,500 feet AGL). This means that flares would burn out approximately 4,100 feet AGL.

(U) Effective air combat training requires that pilots instantaneously react to a threat by deploying chaff or flares as defensive counter measures. Wind direction and speed at and below deployment altitude affects the drifting and ultimate deposition of residual materials. For the purpose of this document, all chaff fibers are assumed to fall to the ground under the airspace and are assumed to be evenly distributed throughout the airspace. In actual practice, pilots tend to avoid flying near the boundaries of the airspace to avoid flying outside of it. This practice reduces the use of flares and chaff within 1 to 2 miles of the airspace edge.

(U) Modern chaff (such as RR-188) consists of bundles of extremely small strands of aluminum-coated silica fibers that are designed to reflect radio waves from a radar set. It is made as small and light as possible so that it will remain in the air long enough to confuse enemy radar. Individual chaff fibers (known as “angel hair” chaff) are approximately the thickness of a very fine human hair and range in length from 0.3 inch to 1.0 inch (0.76 centimeters to 2.5 centimeters). The length of the chaff determines the frequency range of the radio wave most effectively reflected by that particular fiber. Chaff fibers are cut to varying lengths to make them effective against the wide range of enemy radar systems that may be encountered. Chaff and flare use is allowed only in approved Restricted and Warning Areas.

(U) *Unexploded Ordnance*

(U) UXO may be defined as explosive munitions that were deployed but did not detonate as intended. Unexploded munitions may still pose a detonation risk, even many years after initial deployment. Ground-disturbing activities have in the past resulted in encounters with UXO on YAB. Such encounters can temporarily shut down the base. The potential location of UXO is difficult to predict.

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(U) 3.5 UTILITIES

(U) 3.5.1 Definition of the Resource

(U) The existing utilities YAB considered for this discussion is the potable water supply, storage capacity and distribution, sanitation (wastewater) system, stormwater sewer system, electrical system, the heating/ventilation/air conditioning (HVAC), and communications (telephone and fiber optics).

(U) 3.5.2 Existing Conditions

(U) Potable Water Supply and Storage Capacity

(U) YAB operates an independent potable water production/distribution system, utilizing a series of up to 12 wells that treats and feed seven underground storage tanks (USTs). Water from the storage tanks is pumped into the base distribution system through five booster pump stations connected to five elevated storage tanks. The system has the capability of delivering greater than 2.5 million gallons per day (MGD) with additional supply available through interconnections with the Fussa City and Musashi-Murayama City water systems (Base Wide Water System Study, 2010). The average production/demand is approximately 2.1 MGD, with peak water flows at approximately 2.8 MGD (U.S. Air Force, 2013a). Slightly higher average and peak flows may also now be occurring as a result of the recent JASDF beddown (U.S. Air Force, 2013a).

(U) The base IDP (U.S. Air Force, 2013a) also describes the water supply and capacity system at YAB as unsatisfactory, listing water storage capacity as a limiting factor for the base's ability to meet additional demand for expanded or new missions. Although the base's Natural Infrastructure Assessment (Pacific Air Forces [PACAF], 2011) gave the highest ratings for water source supply and capacity, it was noted that there are basically three separate water systems (East, West, and Main) on the base that are not completely integrated. Because average and peak demands were not available for the three areas, it is possible that there could be less availability for one area when compared to the installation as a whole. The study also found water storage tanks are not high enough and distribution pipelines are generally small, which causes water pressure and flow issues. As a result, there can be issues meeting fire protection demands. Storage tanks cannot be elevated any further in some locations due to height requirements around the flight line.

(U) Currently, YAB must pump groundwater directly into the distribution system to meet peak demands. According to the IDP, infrastructure planning, to meet future water-reduction and distribution-efficiency goals, should consider the recommendations in the Base Wide Water System Study (MMJ Associates, 2010) for water distribution improvements to be coordinated with other base utility upgrades. New construction and other retrofits would be desirable to employ water efficient fixtures that will continue to help achieve the goal of reducing potable water use 26 percent by 2020.

(U) The Proposed Action infrastructure projects of Phase I are in the improved area of the main base, on the west side of the airfield, with existing underground water lines and service to

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existing buildings to be renovated (584, 102, and 1). This information was provided in geographic information system (GIS) data files. Water lines run north to south, along Travis Street. The new parking proposed for the Modular Squadron Operations (Building 515) and Taxiway Alpha Parking do not overlie existing water lines. There are serviceable fire hydrants located in the vicinity of all proposed construction sites of Phases I and II, with water pressure being the limiting factor to supply emergency service.

(U) Wastewater System

(U) Wastewater from YAB is collected from each building of the main base and is discharged into the base sanitary sewer system. Much of the wastewater from the main base area is collected at building 4091 and gravity conveyed to the south discharge point, which is a lift station in Building 4094. There wastewater enters the municipal Musashi-Murayama wastewater system. Although the wastewater system is more than 30 years old, the YAB IDP (2013) reports the system as adequate with an average daily flow of 2 MGD (U.S. Air Force, 2013a).

(U) Electrical System

(U) The IDP rates the overall electrical system as unsatisfactory. Tokyo Electric Power Co. (TEPCO) supplies power to each substation on Base through two 66 kilovolt (kV) transmission lines originating from the TEPCO Ome and Tama Substations (PACAF, 2010). The predominant distribution system is underground with sections of overhead distribution. A total of 569 poles are installed on-base, several of which are H-frame construction, and all poles are concrete. There are three total substations that supply power to the main base: the Old West Substation, the New West Substation, and the East Substation.

(U) The Old West Substation supplies most of the main base area at 3.3 kV, utilizing 26 individual circuits. The constraints for future base operations and development, from the electrical system, is the age and condition of the old west substation. Maintenance requirements for this substation and its downstream circuits are significant and costly; repair parts are also increasingly difficult to obtain. Completion of the transition from the old to the newer west substation would be necessary to maintain efficient and reliable electrical supply for YAB (U.S. Air Force, 2013a).

(U) The New West substation only provides power to limited main base facilities at 66 kV via two circuits (numerous circuits still require completion). This substation is fed from the local TEPCO grid at 60 kV from four primary transformers.

(U) The East Substation is operating beyond its expected service life and is programmed for replacement (PACAF, 2010). Currently, a new East substation is being built which runs through the east housing area and will follow the fence line of the base. This would allow future electrical utility on the east side of the airfield for operations that require higher electrical draw. New permanent construction on the main base that would require electrical service would require new power poles supplying electricity from the Old West substation or, in the near future, by the new East Substation built by the Government of Japan (Site Visit, 2013).

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(U) HVAC Systems

(U) HVAC refers to the entire system and range of procedures required for heating and cooling on the Air Base. The central heating/cooling systems on YAB consist of complete high pressure steam, high temperature hot water, low pressure steam, and a low temperature hot water distribution system (HTHW). This is accomplished by four boiler plants that provide steam/HTHW delivering comfort heating and domestic hot water heating systems throughout the base. Two of the four plants boilers (F-Plant and L-Plant) provide the Main Base with steam. The F-Plant boiler is relatively new and appears adequate to serve the military family housing (MFH) heating and domestic hot water requirements. The boilers at L-Plant are 37 years old and are scheduled to be removed. Once the L-Plant is taken offline, the F-Plant may not be adequate to service the Main Base as well as the Main Base North Area and Main Base South Area MFH. The *Master Infrastructure Plan* (2011) stated that existing steam/HTHW piping that is over 20 years old is deteriorated and failing. Any additional heating and cooling due to future development would need satellite water boilers to meet additional HVAC needs (Site Visit Notes, 2013).

(U) Communications

(U) *Fiber optics:* The current condition of the base's copper and fiber communications network is described as degraded. The majority of YAB buildings have been connected to the base fiber optic network, however some facilities still only have copper-wire connections. This limits both data transfer quantities, speeds, and capabilities such as video conferencing (U.S. Air Force, 2013a). Limited fiber optic cabling is available on the east side of the airfield.

(U) *Telephone:* Telephone service exists throughout the main base by an on-site digital communication system which services command and control, logistic, diplomatic and administrative traffic (Metcalf, 2006). A GIS map layer was not provided to show existing underground telephone lines, but in general, overhead telephone lines providing service to existing buildings are located along the same overhead utility poles as the power lines. Any new service to be provided on the either side of the airfield would be run overhead with electrical power supply.

(U) Natural Gas

(U) Natural gas is supplied from off base by a gas pipeline (YAB, 2013). Natural gas lines are not located in the vicinity of construction sites Phase I or II.

(U) 3.6 HAZARDOUS MATERIALS/WASTE AND SOLID WASTE

(U) 3.6.1 Definition of the Resource

(U) Military installations frequently use hazardous materials (HAZMAT) and generate hazardous and solid waste to achieve mission requirements. HAZMAT is defined as any material that could pose an unreasonable risk to health, safety, or the environment if improperly handled, stored, issued, transported, labeled, or disposed of due to certain characteristics of the

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material as listed in the JEGS. Characteristics include health or physical hazards that result from the material being carcinogenic, corrosive, toxic, or flammable, among other hazards. Munitions are excluded from the definition of hazardous materials.

(U) Hazardous waste is defined in the *Hazardous Waste Management Plan* (YAB, 2013) as a discarded solid, semi-solid, or liquid material, or material that contained gas, which either exhibits a characteristic of hazardous waste as identified in the JEGS or is a compound listed in Appendix A of the JEGS.

(U) Solid waste is defined as any discarded non-hazardous material (solids, semi-solids, liquids, sludge, or contained gases) that results from residential, industrial, and commercial operations, or from community activities. Material is considered discarded if it is disposed, abandoned, recycled, reclaimed, used, spent, inherently waste-like (i.e. no longer meeting the specifications for its originally intended use), used in a manner constituting disposal, burned or incinerated, burned for energy recovery, or accumulated or stored in anticipation of any of the above actions (YAB, 2010). Solid waste typically includes garbage, refuse, sludge, and other similar materials. The definition does not include domestic sewage or other significant pollutants in water resources, such as silt or industrial wastewater effluent.

(U) 3.6.2 Policies and Regulations

(U) The Air Force manages hazardous and solid waste at YAB in accordance with the JEGS and AFI 32-7042, *Waste Management*, to the extent that the AFI does not conflict with the JEGS. The JEGS generally address the generation, storage and handling, and disposition of hazardous materials, hazardous waste, and solid waste in Chapters 5, 6, and 7, respectively. Proper handling, characterization, labeling, storage, transportation, documentation, and disposal are discussed in detail. Additional wastes and hazardous materials addressed in the JEGS include medical waste (Chapter 8), petroleum, oil, and lubricants (POLs) (Chapter 9), pesticides (Chapter 11), polychlorinated biphenyl (PCB) wastes (Chapter 14), asbestos (Chapter 15), and lead-based paint (Chapter 17). POL spill prevention and response planning and storage tank regulation is addressed in Chapters 18 and 19.

(U) AFI 32-7042 outlines requirements for a Hazardous Waste Management Program, Integrated Solid Waste Management Program, and PCB waste management. The AFI describes the Air Force's management of municipal and industrial solid waste, construction and renovation debris, hazardous waste, and PCB waste. The AFI does not address radioactive waste (except mixed waste) or medical waste; these substances are addressed in AFI 40-201 (*Managing Radioactive materials in the Air Force*) and AFI 41-201 (*Managing Clinical Engineering Programs*). The AFI requires all installations to have a Hazardous Waste Management Plan (HWMP) that contains, at a minimum, a waste inventory, waste analysis plan, management and reporting procedures, training plan, waste minimization plan, pollution prevention plan, and reference to the installation preparedness and spill prevention plan. Installations also must have an ISWMP (i.e., an Integrated Solid Waste Management Plan). The ISWMP contains guidance for managing solid waste, compost materials, and construction and renovation debris, and additionally requires establishment of a recycling program.

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(U) In addition to requirements in the JEGS and the installation's HWMP (YAB, 2013) and ISWMP (YAB, 2011), various wastes and materials are also managed according to the following documents:

- (U) *Hazardous Material Management Plan & Ozone Depleting Substances Management Plan* (YAB, 2011a): The *Hazardous Materials Management Plan* provides information for properly managing hazardous materials, including the procurement, storage, use, tracking, and disposal of such materials. ODS are included in the plan and are subject to additional rules.
- (U) *Spill Prevention and Response Plan* (YAB, 2012a): The plan integrates the base's spill prevention, control, and countermeasure plan and the oil and hazardous substance pollution contingency plan into one document. The plan provides direction for prevention, control, cleanup, and reporting of spills or other mishaps involving POLs, hazardous materials and hazardous wastes, pesticides, and PCBs.
- (U) *Storage Tank Management Action Plan* (YAB, 2010b): The storage tank management plan was developed to assist the Installation Commander in complying with applicable policies and requirements for above-ground storage tanks (ASTs) and USTs containing POLs, and to provide guidance for operating and managing tanks. The plan incorporates requirements of the JEGS (Chapters 9 and 19), as well as numerous DoD regulations and guidelines including AFPD 32-70 (*Environmental Quality*), AFI 32-7044 (*Storage Tank Compliance*), DoD Instruction (DoDI) 4715.05 (*Management of Environmental Compliance at Overseas Installations*), and DoDI 4715.08 (*Environmental Remediation for DoD Activities Overseas*). The plan contains information on compliance requirements, spill prevention and response planning requirements, industry standards and guidelines, and recommended management actions.
- (U) *Compliance Assurance and Pollution Prevention Management Action Plan Update* (YAB, 2010). The Compliance Assurance and Pollution Prevention (CAPP) program was established to achieve environmental compliance and to reduce compliance burden through pollution prevention (P2). Federal agencies must implement P2 primarily through source reduction. The CAPP management action plan includes applicable requirements, a compliance site inventory, audit findings, evaluation of the base's Environmental Management System, and goals for the base's environmental programs.
- (U) *Asbestos Management and Operations Plan* (YAB, 2010a): The asbestos management plan establishes management and organizational responsibilities and procedures to ensure personnel and environments on YAB are not exposed to excessive levels of airborne asbestos fibers. Among other requirements, the plan specifies asbestos identification surveys for facilities scheduled for demolition or major renovation.

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(U) 3.6.3 Existing Conditions

(U) Hazardous Material Management

(U) HAZMAT is managed on YAB according to the *Hazardous Material Management Plan & Ozone Depleting Substances Management Plan*. The plan addresses three major areas: the HazMart Pharmacy program; HAZMAT reduction and elimination; and reduction or elimination of use of ODS. The HazMart Pharmacy (374 LRS/LGRMSH) is the single point of control and accountability for procurement, receipt, and distribution of all HAZMAT on YAB. All HAZMAT brought onto YAB is processed through the Pharmacy. This centralized control reduces the likelihood of excess HAZMAT inventories and hazardous waste (due to expiration of HAZMAT) occurring on the base. Requests to procure HAZMAT are sent to Bioenvironmental Engineering Flight (374 AMDS/SGPB), Environmental (374 CES/CEIE), and Wing Safety (374 AW/SE) for approval. All three offices must provide approval before any material is procured. Once approvals are obtained, the request is routed to the applicable shop supervisor, the HazMart Pharmacy, and the Fire Department. The requestor must comply with all restrictions specified by the authorizing offices. Contractors must also request approval for HAZMAT use on the installation.

(U) The plan provides comprehensive directions for HAZMAT handling, storage, and labeling. HAZMAT is typically grouped into classes that represent the type of hazard of the material, so that incompatible storage can be avoided. Incompatible materials have the potential to react and cause explosions or fires. The plan recognizes nine different hazard classifications. The plan provides detailed directions for storage of flammable, combustible, and corrosive materials. The plan also specifies personnel safety and emergency response, record keeping, training, and inspections.

(U) The plan encourages reduction in HAZMAT use where practical through recovery, recycling, source reduction, and other strategies. The plan specifies hazardous waste reduction by substituting less hazardous or non-hazardous substances when possible, and reducing the volume of HAZMAT used. The plan also specifies hazardous waste elimination through actions such as neutralizing acids/bases and recycling through redistribution. A partially used HAZMAT that is no longer needed may be offered for use in another shop or application.

(U) ODS are substances that affect the Earth's ozone layer. ODS have been categorized into different classes. Class I substances have already been banned from manufacturing, and Class II substances will be restricted in the future due to phase out dates. YAB implements the following actions as feasible:

- (U) Prohibit the purchase of all Class I ODS unless permitted by waiver.
- (U) Prohibit the purchase of halon fire extinguishing equipment and ODS air conditioning and refrigeration equipment.
- (U) Modify operational practices and implement measures to reduce atmospheric discharge.
- (U) Identify and manage ODS use based on mission impact priorities.

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(U) Hazardous Waste Storage, Handling, and Disposal

(U) Hazardous waste management at YAB is specified in the HWMP, which was developed in accordance with the JEGS. Hazardous wastes originate at an Initial Accumulation Point (IAP) or a Hazardous Waste Generation Point (HWGP). An IAP is a shop, site, or other work center where waste is generated over time through the normal course of operations. IAPs must be formally established and certified by the Hazardous Waste Program Manager. No more than 55 gallons of hazardous waste or one quart of acute hazardous waste may be accumulated at an IAP. An HWGP is an industrial shop or facility where a specific hazardous waste is generated on a scheduled, recurring basis (for example, the replacement of an entire quantity of used oil from equipment due to maintenance requirements). Such wastes must be generated at one time and may not be accumulated for more than 24 hours.

(U) When the accumulation quantity or time limit is reached, or at designated time intervals, waste is moved from the IAP or HWGP to the Hazardous Waste Storage Area (HWSA), which is an interim storage site where it is collected and ultimately shipped off-base for treatment or disposal. Hazardous waste may be stored at the HWSA for up to one year. Building 954 is the location of the only HWSA on the installation. With the exception of Energy Recovery Materials (ERMs), all hazardous waste is transported from the HWSA to Defense Logistics Agency Disposition Services (DLA-DS) Sagami. Transport is arranged by 374 CES/CEIE. ERM refers to used material burned for the purpose of energy recovery (e.g., used oil). Management of these materials is provided by local Japanese contractors.

(U) The HWMP provides requirements and procedures for all aspects of hazardous waste management on the base. Procedures applicable to IAPs and/or HWSAs include IAP establishment criteria, IAP/HWSA layout and design criteria, required equipment and documentation, storage container requirements, secondary storage, labeling and tracking, turn-in process, emergency contingency plan and spill prevention and response plan, transportation, and personnel training requirements. IAP, HWGP, and HWSA managers must complete initial and annual refresher training. In addition to general hazardous waste management procedures, the HWMP also provides instructions for specific waste streams. There are 17 waste streams identified, including but not limited to ERM, used engine oil and hydraulic fluid, batteries, fluorescent light tubes and ballasts, and PCBs.

(U) Petroleum, Oil, and Lubricant Storage Tanks and Facilities

(U) Numerous USTs and ASTs are located on YAB (Figure 3-7). There are currently approximately 137 USTs and 130 ASTs, although the number fluctuates regularly due to ongoing activities on the base (YAB, 2013). The tanks primarily store JP-8 jet fuel, diesel fuel, and motor vehicle gasoline (MOGAS), but may hold other substances such as heating fuel. The largest UST holds 4.5 million gallons of JP-8, while the largest AST holds 422,000 gallons of diesel fuel. There are two 5.2 million-gallon cut and cover JP-8 tanks located on the flightline. Bulk JP-8 fuel shipments are generally delivered by rail to the receipt facility/pumphouse at the

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south end of the base (Building 4091). Underground piping carries the fuel to storage tanks, which then supplies the hydrant fuel system (YAB, 2013).

(U) Spill prevention and control priorities include bulk POL storage areas (areas with a stored volume greater than 1,320 gallons or any tank with a capacity greater than 660 gallons); high capacity POL pipelines; POL transfer, loading, and unloading areas; and pretreatment devices such as oil-water separators and grease traps. Bulk fuel storage of JP-8, diesel, and MOGAS occurs at four areas on YAB, including the South POL area at Building 4137, Northern POL area at Building 60, Central POL area at Building 300, and the POL area at Building 1351/1343 with two storage tanks in the infield east of the runway.

(U) Other POL facilities are associated with the flightline, heating/steam plants, emergency generator tanks, refueling tanks, waste oil storage, transformers, and pretreatment devices. Flightline storage and distribution consists of flightline fuel pump houses that distribute fuel through underground pipelines. POL storage typically includes several USTs at each pump house located in the infield east of the runway.

(U) The base's *Spill Prevention and Response Plan* (YAB, 2012a) contains spill prevention, control, cleanup, countermeasures, and reporting procedures for POL and other applicable substances. Spill prevention includes measures such as storage and handling procedures, construction materials requirements, maintenance and inspections, security, and personnel training. Secondary containment plus sufficient freeboard is required for POL quantities greater than 55 gallons. In the event of a POL (or other hazardous substance) release, the plan outlines response procedures including site management, identification of hazardous substances, hazard/risk assessment, protective measures, control of the release, protection of critical resources, decontamination, and cleanup and restoration activities. The plan lists the five worst case spill scenarios and discusses associated impacts and responses.

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(U) Figure 3-7. Fuel Storage and Infrastructure

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(U) Solid Waste

(U) Solid waste management is carried out according to the ISWMP. The plan outlines numerous steps for solid waste disposition, with diversion being preferable to incineration or delivery to a landfill. Diversion actions included source reduction, reuse, donation, recycling, and composting/mulching. These activities help the installation achieve the DoD's waste diversion rate goals.

(U) All solid waste that is not diverted is collected and disposed of by a contractor, either in an off-base landfill or by incineration. Contractors must be permitted by local and prefectural authorities. The disposal contractor provides recyclable and non-recyclable waste collection, processing, and disposal services. After collection, waste is transported to an on-base segregation area. Recyclable waste is sorted by type, and non-recyclable waste is sorted as burnable and non-burnable. Recyclables are segregated using a sorting conveyor belt, and the contractor retains profits received from the recovery and sale of recyclable material. A portion of non-recyclable material is disposed of in on-base incinerators, which are operated and maintained by a separate contractor. The ash is transported to an off base facility for disposal by service contract. The remaining material that is not recycled or incinerated is taken to an off-base landfill. Construction debris may be generated during work performed by base personnel or by construction contractors. Contractors are required to recycle and dispose of debris generated under their contract requirements. Under Japan law, it is expected that the majority of contractor-generated debris is recycled.

(U) According to the most recent version of the ISWMP (YAB, 2011), the solid waste contractor estimates that about 1,129 tons of non-recyclable waste was disposed of off-base in FY2008. About 1,953 tons were disposed of in FY2009. The on-base incinerator processes about 11 to 12 tons of refuse daily. Solid waste generation and disposal between FY2006 and 2009, as provided in the ISWMP and IDP, is shown in Table 3-4. The table excludes construction and demolition (C&D) debris. C&D projects have the potential to generate large quantities of waste debris such as asphalt, concrete, wood, metals, gypsum wallboard/drywall, roofing, land clearing waste, and other material. In FY2009, 98 percent of C&D material was recycled (YAB, 2011). By 2020, 65 percent of all solid waste generated on YAB is to be recycled, with the remainder being incinerated.

(U) Table 3-4. Solid Waste Disposition on Yokota Air Base

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Fiscal Year	Generated (tons)	Recycled (tons)	Disposed (tons)	Incinerated (tons)	Diversion Rate*
2006	14,068	7,270	198	6,599	25%
2007	11,168	5,012	160	5,995	36%
2008	22,632	16,816	141	5,675	35%
2009	10,455	4,812	155	5,488	36%
2010	Data not provided	3,365	5,786 (disposed and incinerated)		37%
2011	Data not provided	3,233	6,031 (disposed and incinerated)		35%
2012	Data not provided	3,177	6,200 (disposed and incinerated)		34%

(U) Source: YAB, 2011; U.S. Air Force, 2013a; YAB, 2013

(U) *Does not include construction and demolition debris

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(U) Recent information gained through interviews with base personnel suggest that essentially no solid waste is currently transported off YAB to landfills. All waste is either recycled or incinerated to ash. The ash remains on the installation for disposal.

(U) Other Wastes Potentially Applicable to the Proposed Action

(U) Hazardous wastes besides those discussed in detail above could be encountered during construction or renovation activities associated with the Proposed Action. Such wastes include asbestos containing material (asbestos), PCBs, and lead paint. The base's *Asbestos Management and Operations Plan* provides details of asbestos management on the installation. Generally, asbestos is managed in place (without removal). However, asbestos can be encountered during facility renovation, and abatement may be required in these cases. Any project that includes renovation or demolition of all or some portion of a facility must be reviewed by 374 CES/CEIE for potential asbestos issues. 374 CES/CEIE conducts a review of available data on asbestos occurrence. If presence or absence is not known, an asbestos survey is conducted, including intrusive testing of concealed materials. If asbestos is known or found, a report is prepared that contains the amount of asbestos, required abatement procedures, and safety requirements. Project planners then review the report and determine if the project is feasible based on these requirements. Emergency evacuation routes are typically identified in advance. PCB wastes may include dielectric fluids, transformers, capacitors, or other electrical devices. PCBs may also be found in components of air conditioners, washing machines, refrigerators, televisions, or microwave ranges. Management and disposal of such materials are conducted according to Chapter 14 of the JEGS and the *Yokota Air Base PCB Management Plan*.

(U) 3.7 WATER RESOURCES

(U) 3.7.1 Definition of the Resource

(U) There are no wetlands or floodplains within the project area, therefore surface water, groundwater and stormwater are discussed in this section.

(U) 3.7.2 Existing Conditions

(U) Surface Waters

(U) There are no natural lakes, rivers, or streams on YAB. The nearest surface waters are the Tama River located approximately one mile from the base, and two large reservoirs, the Murayama Reservoir and Yamaguchi Reservoir located about two miles northeast of the base (374 Airlift Wing, 2012).

(U) Groundwater

(U) YAB has at least two groundwater systems; a shallow and a deep aquifer. Both the shallow and deep aquifers flow to the south-southeast. The shallow aquifer lies about 50 feet below ground surface and has a hydraulic connection to the Tama River. The deep aquifer lies

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approximately 250 feet below ground surface, and is the groundwater system from which all 12 YAB wells can draw (U.S. Air Force, 2005).

(U) The rate of water flow through the deep aquifer under saturated conditions was calculated for the *Source Wellhead Protection Study Report for Yokota AB* as approximately 30,000 gallons per day per foot (U.S. Air Force, 2005). Nine of 12 wells produce potable water for the base where it is treated and distributed, and discussed in the utilities section of this ER. The Air Force also purchases treated drinking water from the Fussa City and Musahsi-Muryama Water Treatment Plant located off-base (U.S. Air Force, 2013a). Water quantity supplied to the base is sufficient for current and future operations, but storage capacity is limited and discussed in the Utilities section of this ER.

(U) The *Source Wellhead Protection Study Report for Yokota AB* identified sources with the potential to cause contamination on the base and then develop Wellhead Protection Areas (i.e., WHPAs) within which certain activities would be avoided. Potential contaminant sources on YAB include petroleum facilities, vehicle maintenance facilities, waste disposal facilities, septic tanks, and industrial activities (U.S. Air Force, 2005). The WHPAs were defined for the base as the area in which water from the surface is “captured” and recharges the deep aquifer and in this instance included the whole of YAB; therefore, any spill or release on the base would likely end up in the deep aquifer, which is the main drinking water source for YAB (U.S. Air Force, 2005). While the JEGS do not have specific requirements pertaining to WHPAs, JEGS Section 3-3.1 states that the DoD will protect all water supply sources from contamination. Therefore, the groundwater is monitored by the YAB Bioenvironmental Engineering Flight (374 AMDS/SGPB) by monitoring well water and compliance points in the water distribution system for water quality within the base. Volatile organic compounds (VOC) have been detected in compliance point samples, but in concentrations less than the JEGS maximum contaminant levels. Drinking water is monitored in compliance with the JEGS Chapter 3 requirements (U.S. Air Force, 2005).

(U) The 2013 YAB IDP (U.S. Air Force, 2013a) reports that water meets the primary and secondary drinking water standards and there are no contaminants in the water that require additional treatment. Water that is determined to be degraded is treated to meet the primary drinking water standards.

(U) **Stormwater**

(U) The base has well-maintained storm water ditches, an artificial concrete-lined water reservoir adjacent to the East Gate, and a natural bottom impoundment located on the southern end of the runway. No other surface water resources are present on YAB. The installation does not receive stormwater originating from off-installation; therefore off-installation activities are not considered a risk to the natural resources that are on the installation.

(U) All grounds on-base are semi-improved and all surface water is directed to a network of drainage ditches and storm sewers. Surface water flow generally follows YAB topography until the water intersects the on-base storm water drainage system. Surface water flows into the network of storm sewer inlets, travels through the stormwater sewer system and eventually discharges off-base into the Tama River (U.S. Air Force, 2005).

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(U) As mandated in the JEGS, YAB manages stormwater runoff within the guidelines of their *Stormwater Pollution Prevention Plan* (SWPPP) and *Spill Prevention and Response Plan*, which incorporates both a spill prevention control and countermeasures plan and an oil and hazardous substance contingency plan, to provide for the prevention, control, cleanup, and reporting of oil and hazardous substance releases at the base (U.S. Air Force, 2005).

(U) The IDP (U.S. Air Force, 2013a) rated the stormwater sewage system to be satisfactory at YAB. The Natural Infrastructure Assessment (2011) reported a substantial rain (over one inch per hour) that caused a very large flood in residential Yokota. It did not report how the flood affected the main base; but otherwise, the stormwater infrastructure met stormwater requirements 35 out of 36 months, and the discharge infrastructure was rated capable of handling average and peak demands (PACAF, 2011).

(U) 3.8 BIOLOGICAL RESOURCES

(U) 3.8.1 Definition of the Resource

(U) This section provides a description of the vegetation and wildlife on YAB, including general base-wide occurrence and occurrence within specific project areas. Biological resources are described for the main base only. The potential occurrence of endangered, threatened or otherwise protected species is discussed. Information on biological resources was obtained from the base's *Integrated Natural Resources Management Plan* (INRMP) (USACE, 2012) and a biodiversity survey of YAB (USACE, 2001).

(U) 3.8.2 Existing Conditions

(U) Vegetation

(U) The Japanese archipelago has a great diversity of climate and vegetation, and supports up to 6,000 native plant species (USACE, 2012). Climate and topography are conducive to forest development, with approximately 67 percent of Japan being forested (although only 18 percent is considered natural forest). YAB is located in the Kanto region of Honshu, which supports three vegetation zones: cool-temperate broad-leaved deciduous forest, warm-temperate broad-leaved evergreen forest, and subalpine deciduous broad-leaved thicket. However, natural vegetation in this densely populated region has generally been reduced to small zones where human activity is limited, such as mountainous areas, peninsulas, and wetlands (USACE, 2001).

(U) The area now occupied by YAB appears to have been broad-leaved deciduous forest as recently as the late 1930s (USACE, 2012). However, the site has since become heavily developed. Only 207 of the base's total 1,749 acres are considered recreational or open space (USACE, 2012). Biodiversity field surveys conducted at the base in 1999 concluded that the majority of the land area is developed urban landscape with limited natural resource occurrence (USACE, 2001). Vegetation is generally limited to maintained grass and ornamental trees. Japanese lawn grass (*Zoysia japonica*) has been planted at residential neighborhoods, school

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grounds, the golf course, and non-paved portions of the flight line area (USACE, 2001). Ornamental deciduous vegetation and trees, planted for aesthetic value and shade, occur along streets and sidewalks and within residential areas and community parks. Most large trees are located in the East Military Housing Area. Grassy areas within the airfield comprise most of the installation's undeveloped space.

(U) Two exceptions were identified on or adjacent to the base during the 1999 biodiversity surveys (USACE, 2001). The two areas include a deciduous broad-leaved forest in the southern runway approach light area located adjacent to the base, and a 0.1-acre emergent aquatic plant community surrounding a stormwater impoundment near the fuel farm. The forest area is composed of two adjacent parcels and may be remnant natural forest habitat. The parcels are outside the base boundary but are enclosed by security fences that protect the installation's landing lights. The canopy previously consisted primarily of oak (*Quercus serrata*), Japanese chestnut oak (*Q. acutissima*), and hornbeam (*Carpinus laxiflora*). Other species within the forest included maple (*Acer momo* f. *connivens*), eurya (*Eurya japonica*), beauty berry (*Callicarpa mollis*), ivy (*Hedera rhombea*), kouyabouki (*Pertya scandens*), akebia (*Akebia trifoliata*), and lopseed (*Phryma leptostachya* spp. *Asiatica*). However, a portion of the trees in this area have been recently cut to maintain compliance with Mandatory Frangibility Zone requirements (YAB, 2013). The plant community surrounding the water impoundment is dominated by common reed (*Phragmites australis*), which is typical of shoreline wetland communities. Other plant species often associated with this community type include dokudami (*Houttuynia cordata*), water-pennywort (*Hydrocotyle raniflora*), dropwort (*Oenanthe javanica*), and beggar-tick (*Bidens frondosa*). Neither of these areas is located within proposed project sites.

(U) Wildlife

(U) Limited information is available concerning wildlife on YAB. Few studies have been conducted due to the heavily developed nature of the installation. Biodiversity studies conducted in 1999 (USACE, 2001) focused on bird species because of the presumed reliability of bird presence as an indicator of overall biodiversity. The study authors concluded that, compared to birds, ground dwelling mammals are generally more restricted in movement through urbanized areas and are therefore more easily trapped by habitat fragmentation. Therefore, small mammal occurrence does not necessarily correlate with high quality habitat. Conversely, birds have greater ability to move and select more desirable habitat. Thus, the 1999 faunal surveys consisted of a census of bird presence/absence. Surveys were conducted along a line that transects the covered residential and urban areas east and west of the airfield. A total of 49 species were recorded. The base INRMP lists a small number of additional species recorded, although the source is not provided. The Japanese archipelago is a major East Asian flyway and Japan generally supports a large number of birds. The combined list of bird species observed at YAB is provided in Table 3-6.

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(U) Table 3-5. Bird Species Observed at Yokota Air Base

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Scientific Name	English Name	Japanese Name
<i>Accipiter gentilis</i>	Goshawk	Otaka
<i>Aegithalos caudatus</i>	Long-tailed tit	Enaga
<i>Alauda arvensis</i>	Skylark	Hibari
<i>Anas poecilorhyncha</i>	Spotbill duck	Karugamo
<i>Anthus hodgsoni</i>	Chinese tree-pipit	Binzui
<i>Anthus spinolella</i>	Water pipit	Tahibari
<i>Ardea cinerea</i>	Grey heron	Aosagi
<i>Asio flammeus</i>	Short-eared owl	Komimizuku
<i>Apus affinis</i>	House swift	Himeamatsubame
<i>Bambusicola thoracica</i>	Bamboo partridge	Kojukei
<i>Bubulcus ibis</i>	Cattle egret	Amasagi
<i>Carduelis sinica</i>	Oriental greenfinch	Kawarahiya
<i>Cettia diphone</i>	Bush warbler	Uguisu
<i>Charadrius placidus</i>	Long-billed plover	Ikaruchidori
<i>Cisticola juncidis</i>	Fan-tailed warbler	Sekka
<i>Coccothraustes coccothraustes</i>	Hawfinch	Shime
<i>Corvus corone</i>	Carriion crow	Hashibosogarasu
<i>Corvus macrorhynchos</i>	Jungle crow	Hashibutogarasu
<i>Columba livia</i> var.	Rock pigeon	Dobato
<i>Cuculus canorus</i>	Cuckoo	Kakko
<i>Cyanopica cyana</i>	Azure-winged magpie	Onaga
<i>Delichon urbica</i>	House martin	Iwatsubame
<i>Dendrocopos kizuki</i>	Pigmy woodpecker	Kogera
<i>Egretta alba</i>	Great white egret	Daisagi
<i>Egretta intermedia</i>	Intermediate egret	Chusagi
<i>Emberiza cioides</i>	Siberian meadow bunting	Hoojiro
<i>Emberiza rustica</i>	Rustic bunting	Kashiradaka
<i>Emberiza spodocephala</i>	Black-faced bunting	Aoji
<i>Eophona personata</i>	Japanese grosbeak	Ikaru
<i>Falco peregrinus</i>	Peregrine falcon	Hayabusa
<i>Falco tinnunculus</i>	Common kestrel	Chogenbo
<i>Ficedula narcissina</i>	Narcissus flycatcher	Kibitaki
<i>Hirundo rustica</i>	Barn swallow	Tsubame
<i>Hypsipetes amaurotis</i>	Brown-eared bulbul	Hiyodori
<i>Lanius bucephalus</i>	Bull-headed shrike	Mozu
<i>Larus argentatus</i>	Herring gull	Segurokamome
<i>Milvus migrans</i>	Black kite	Tobi
<i>Motacilla alba</i>	White wagtail	Hakusekirei
<i>Motacilla grandis</i>	Japanese wagtail	Segurosekirei
<i>Parus aeter</i>	Coal tit	Higara
<i>Parus major</i>	Great tit	Shijukara
<i>Parus varius</i>	Varied tit	Yamagara
<i>Passer montanus</i>	Tree sparrow	Suzume
<i>Phalacrocorax carbo</i>	Common cormorant	Kawau
<i>Phasianus colchicus</i>	Ring-necked pheasant	Kiji
<i>Phoenicurus auroreus</i>	Daurian redstart	Jobitaki
<i>Phylloscopus coronatus</i>	Crowned willow warbler	Sendaimushikui
<i>Picus awokera</i>	Japanese green woodpecker	Aogera

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(U) Table 3-5. Bird Species Observed at Yokota Air Base, Cont'd

UNCLASSIFIED		
Scientific Name	English Name	Japanese Name
<i>Streptopelia orientalis</i>	Rufous turtle dove	Kijibato
<i>Sturnus cineraceus</i>	Gray starling	Mukudori
<i>Tarsiger cyanurus</i>	Siberian bluechat	Ruribitaki
<i>Turdus pallidus</i>	Pale thrush	Shirohara
<i>Turdus naumanni</i>	Dusky thrush	Tsugumi
<i>Zosterops japonica</i>	Japanese white-eye	Mejiro

(U) Source: USACE, 2012; USACE, 2001

(U) During the 1999 surveys, two bird species accounted for over half of the total sightings: tree sparrow and gray starling. The majority of species recorded (60 percent) are typically associated with urban and grassland habitat. Approximately 20 to 30 percent of recorded species are considered forest dwellers. It is possible that birds of prey forage on small mammals in the forested approach light area (USACE, 2001).

(U) The INRMP alludes to other surveys that have been conducted in the forest area south of the base. At least some of these surveys have apparently documented wildlife species other than birds, although a species list is not provided. The stormwater impoundment described in Section 3.7.2 supports at least a marginal freshwater fish population (USACE, 2001).

(U) Protected Species

(U) Protected species generally include endangered, threatened, and natural monument species. Endangered species are those species identified under U.S. law, Japanese law, or a treaty in which the U.S. is a party, as either currently in danger of extinction or considered likely to be so within the foreseeable future throughout all or a significant portion of their range. Threatened species are those species considered likely to become endangered within the foreseeable future throughout all or a significant portion of their range. Natural monument species are those with particular value or those considered characteristic of or unique to Japan, whether native or non-native, and that are protected under national, prefectural, or local cultural laws.

(U) Endangered, threatened, and natural monument species of Japan are listed in the JEGS and the base INRMP. Various U.S. and Japanese laws have been incorporated by reference into the JEGS and form the regulatory basis for the U.S. Air Force's management of protected species (USACE, 2012). The U.S. is signatory to the Migratory Bird Treaty Act and the Convention on International Trade in Endangered Species (CITES). Other relevant Japanese laws include the Law for the Conservation of Endangered Species of Wild Fauna and Flora, and the Law for the Protection of Cultural Properties. Additional Japanese prefectural or municipal laws may also address natural resource protection (USACE, 2012).

(U) Species considered to be at risk in Japan are included in the Red List and the Red Data Book of Japan (RDB). The Red List is a compilation of endangered wildlife species of Japan, whereas the Red Data Book, published by the Ministry of the Environment, provides population

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data for the species included in the Red List. The Red List and RDB provide an assessment of the risk of extinction based on biological data. Listed species may be categorized according to several classifications, with Extinct and Extinct in the Wild categories denoting the most extreme level of impact. Critically Endangered, Endangered, and Vulnerable species are those considered to be facing “extremely high,” “very high,” and “high” risk of extinction in the wild, respectively, with risk determined by several criteria related to population size and geographic range. A Near Threatened species is one that does not currently qualify for one of the preceding categories, but is close to or likely to qualify in the near future. Rare species are those that exist in extremely limited numbers and are usually found in isolated locations or special environments. A Local Population is defined as a species for which local, isolated populations exist but are in danger of disappearing. The Least Concern category refers to those species that do not qualify for any of the preceding descriptions. The Data Deficient category denotes species for which inadequate information exists to make an assessment of extinction risk.

(U) There are currently over 1,300 animal and 2,300 plant species listed in the RDB (USACE, 2012). A number of these occur within the Honshu region. However, relatively few have known occurrence on the YAB main base or associated properties. Local governments, including the Tokyo Metropolitan Government and Saitama Prefecture, also list species as endangered, threatened, vulnerable, or rare. In addition, Iwahashi (1994) (as cited in USACE, 2012) published a list of threatened and endangered plant species of Japan that is included in the YAB INRMP. Animal and plant species listed in the RDB, by local governments, or by Iwahashi (1994), with documented occurrence on the YAB main base, are listed in Table 3-7. Although natural monument species occur within the Tokyo metropolitan area and other areas near YAB, none have been documented on the main base.

(U) The base INRMP describes additional biodiversity surveys conducted between 2005 and 2008 at the southern forested site (AFCEE 2008, as cited in USACE 2012). Six threatened and endangered species were documented, including three plants, one bird, one reptile, and one insect. Presumably, most sightings of protected species near the main base have occurred in this forested area, although four protected bird species were documented inside the base boundary during the 1999 surveys. Listed plants and birds may potentially occur at the northern end of the runway.

(U) Table 3-6. Protected Species with Occurrence on Yokota Air Base

UNCLASSIFIED				
Scientific Name	Japanese Name	English Name	RDB Status	Listed by Local Governments
Mammals				
<i>Vulpes vulpes</i>	Kitsune	Red fox	n/a	•
Birds				
<i>Accipiter gentilis</i>	Otaka	Goshawk	NT	•
<i>Falco peregrinus</i>	Hayabusa	Peregrine falcon	VU	•
<i>Egretta intermedia</i>	Chusagi	Intermediate egret	NT	
<i>Falco tinnunculus</i>	Chogenbo	Common kestrel	n/a	•
<i>Apus affinis</i>	Himeamatsubame	House swift	n/a	•
Reptiles				
<i>Eumeces latiscutatus</i>	Tokage	Five-lined skink	n/a	•

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Insects				
<i>Psephactus remiger</i>	Kobanekamikiri	n/a	n/a	●
Plants				
<i>Potentilla nipponica</i>	Hirohanokawarasaiko	n/a	VU	●
<i>Cephalanthera falcata</i>	Kinran	Helleborine	VU	●
<i>Monochasma sheareri</i>	Kuchinashigusa	n/a	n/a	●

(U) Source: USACE, 2012; USACE, 2001

(U) n/a = not applicable; NT = Near Threatened; RDB = Red Data Book of Japan; VU = Vulnerable

(U) 3.9 CULTURAL RESOURCES

(U) 3.9.1 Definition of the Resource

(U) As per the JEGS (U.S. Forces Japan, 2012), Historic or Cultural Resources are defined as “Physical remains of any prehistoric or historic district, site, building, structure, or object significant in the world, national or local history, architecture, archaeology, engineering, or culture. The term includes artifacts, archaeological resources, records, and material remains that are related to such a district, site, building, structure, or object, and also include natural resources (plants, animals, landscape features, etc.) that may be considered important as a part of a country’s traditional culture and history.” The term *cultural resources* can also refer to sites on the World Heritage List or Japanese or prefectural equivalent of the National Register of Historic Places.

(U) 3.9.2 Existing Conditions

(U) Regulations that govern cultural resources as potentially affected by U.S. Air Force activities overseas include the JEGS (U.S. Forces Japan, 2012). Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions*, DoD Directive 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*, and AFI 32-7061, *Environmental Impact Analysis Process (EIAP)*, require specific activity and set guidelines for Federal agencies abroad to consider and study potential harm to cultural resources resulting from that agency’s actions. These standards will be used to determine if there is significant harm to cultural resources due to the Proposed Action. Cultural Resource site review prior to construction and repair work is covered under Sections 4.1.2 and 4.1.3 of the base’s *Integrated Cultural Resources Management Plan* (ICRMP) (Verhaaren, 2007).

(U) The Kanto Plain in which YAB is located is rich in archaeological resources covering approximately 37,000 years. Potentially 106 recorded sites have been documented within 1.9 miles (3 kilometers [km]) of YAB. Within the Kanto Plain, there are identified sites from the Late Paleolithic (35,000 B.C. to 11,000 B.C.) to the modern historic period (World War II era 1945 and before) (Keally, 2007). The first Jomon period sites bearing pottery (Yoritomon Pottery phase) appear circa 13,500 B.C. to 11,500 B.C. Unlike at the nearby Tama SA, there are no known intact archaeological resources within YAB, primarily due to extensive historic disturbance; however, some intact monuments and structures on YAB are considered historically significant (Verhaaren, 2007).

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(U) The most significant resource both culturally and historically on YAB is the Kofu Stone. This stone memorial, located in front of Building 450, near Gate 2, commemorates a 1944 wartime visit by Emperor Hirohito to the Tama Army Airfield. The Kofu stone is one of 26 monuments or memorials on YAB. There are no monuments identified within the project area.

(U) The one previously documented archaeological site on YAB consisted of a scatter of stone tools dating to the late Paleolithic to early Jomon periods. This site (Fussa 10), now located within the South Housing Area, was documented by a local farmer prior to World War II and is believed to no longer be intact due to subsequent development. YAB also completed an extensive Cultural Resources Survey in 1997 in which three relatively undisturbed areas were tested for intact cultural resource deposits (Verhaaren, 2007). Testing in these areas identified historic artifacts dating from the 17th through the 20th century found in heavily disturbed soils. As a result of this survey, it was determined that no potential for intact deposits existed and no additional testing was recommended. No archaeological resources have previously been identified within the project area.

(U) Remaining historically significant structures on YAB are associated with three defined periods: World War II (1939–1945), Administration by the Supreme Commander, Allied Powers (SCAP) [1945–1952], and the Cold War Alliance (1952–1989/91). Eight remaining structures are associated with the World War II period, 33 structures are associated with the Allied powers occupation period, and 28 structures are Cold War period structures. Building 102, a maintenance hangar constructed in 1948 during the SCAP period, is proposed for use as a maintenance hangar/Aircraft Maintenance Unit (AMU) as part of the Proposed Action and Alternative 1.

(U) 3.10 TRANSPORTATION

(U) 3.10.1 Definition of the Resource

(U) Transportation includes roadway transportation, mass transit such as rail, and commercial air transportation. The ROI is defined as road systems on base and the surrounding network of roads and railways that feed into the base and airspace primarily used by the base. This section focuses on ground based transportation potentially affected by the Phase I and Phase II actions from the addition of more personnel and vehicles. Additionally, the Phase II actions include proposed road additions or modifications. Air transportation will not be addressed in this section but is addressed as applicable in Section 3.1 and 4.1, Airspace. Aspects of transportation relevant to the Proposed Action include road infrastructure, current traffic volume on roads within the project area, the vehicle capacity of those roads, and existing access and exit points at the base entry/exit gates.

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(U) 3.10.2 Existing Conditions

(U) Regional Traffic System

(U) Japan National Highway 16 (Route 16) is the primary road through which traffic flows around and into the eastern half of YAB. Route 16 connects to the Chuo Expressway, the closest high-speed expressway to YAB. Additionally a network of lesser roads carry traffic to and from the cities of Fussa, Musashimurayama, and Tachikawa and Akishima, situated outside of the Fussa and Supply Gates, the East Gate and the South Gate respectively.

(U) The nearest train stations are located in Fussa (Higashi-Fussa Train Station), five minutes from the Fussa Gate, and the Ushihama Train Station, near the Supply Gate, providing rapid transportation throughout the Tokyo metropolitan area. The Hachikou rail line bisects the West and Terminal Gates through East Housing. Another rail, the Seibu Haijima line, delivers fuel to the south end of the base.

(U) Base Traffic System

(U) The condition of the base roads and pavements are adequate with an average age of between 17 and 18 years (U.S. Air Force, 2012). The 2013 IDP describes the base road network as segmented, non-uniform and inefficient as a result of development that occurred over time without comprehensive planning. Because of this, roads and gates are overburdened during peak traffic periods, especially the Terminal and West Gates (Gate 15), which allow access to the West Housing Area (U.S. Air Force, 2013). Other issues identified in the IDP are a lack of alternate transportation modes, such as transit, motor cycles and bicycles, and a need to plan future facility layouts that encourage walking. An issue mentioned in the IDP with direct relevance to the Proposed Action is the road overrun crossings at the north and south ends of the airfield. The road overruns are a safety issue for both vehicles and aircraft, both of which would increase under the Proposed Action.

(U) The Terminal and West Gates, Fussa Gate (Gate 2) and Supply Gate (Gate 5) all access Route 16. Traffic from the West Housing Area must cross Route 16 to enter and exit the base through the Terminal and West Gates (Gates 12 and 15). Access to the west housing/community area is only possible from the main base area via the Terminal Gate. Vehicles transiting to and from the base through the Terminal and West Gates must also cross the Hachikou rail line, which can result in traffic backups when trains are crossing.

(U) The East Gate (Gate 17) allows access to East Housing from off-base. East Housing is also accessed by vehicles along McGuire Avenue which crosses the south runway overrun or Walker Boulevard which crosses the north runway overrun. The South Gate (Gate 18) accesses local streets of Akishima but this gate is not always open.

(U) The Fussa Gate (Gate 2) provides access to the base from Highway 16 and has two lanes available for incoming traffic. During peak morning hours the capacity of the gate is estimated at 800 vehicles per hour (VPH) (U.S. Air Force, 2007). Approximately 90 percent of the morning volume is attributable to vehicles entering the base. Peak afternoon traffic volume is estimated slightly higher at 900 VPH given that workers tend to leave over a shorter period of time than

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they arrive in the morning. The average daily traffic (ADT) volume through Gate 2 and thus along Friendship Boulevard is estimated at 9,000 vehicles.

(U) Study Area Traffic System

(U) Roads and base gates likely to be affected by the Phase I and Phase II actions are shown in Table 3-7 and in Figure 3-8 and Figure 3-9. These roads may experience an increase in vehicle activity, or be temporarily affected by construction.

(U) Table 3-7. Potentially Affected Yokota Air Base Roads and Base Gates within the Proposed Action Study Areas

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Phase I Actions Study Area	Phase II Actions Study Area
Roads	
Davis Street	Walker Blvd (airfield overrun)
Airlift Avenue	General road usage, community destinations such as Base Exchange, etc. (McGuire, Mitchell)
Friendship Blvd	Route 16
Walker Blvd	East Housing Roads
General road usage, community destinations such as middle and high schools (McGuire, Mitchell)	Earhart/James/McGuire Avenues to lesser extent if South Gate used.
Route 16	West & East Housing roads
Gates	
Terminal Gate (#12) near West Housing	East Gate (#17), near East Housing.
Fussa Gate (Gate # 2)	South Gate (Gate 18) (if open)
West Gate (#15)	

(U) In addition to roads and gates located within the proposed study areas, specific transportation issues have been identified in the IDP and JASDF transportation studies that will need consideration in the analysis of the Proposed Action (U.S. Air Force, 2013). The JASDF transportation study and IDP identify a potential issue with the south airfield overrun and traffic flow along McGuire Avenue. Increases in traffic at the intersection of McGuire Avenue and Hamilton could result in standing traffic extending through the south overrun lights, potentially disrupting flight line operations (U.S. Air Force, 2010; U.S. Air Force, 2013). The JASDF study stated the biggest roadway delays would be experienced at McGuire Avenue in the morning (0600–0800) and southbound on Mitchell road in the evening (1530–1730).

(U) Other documented issues and constraints potentially affected by the Proposed Action are the north overrun (Walker Avenue), and the Highway 16 crossing into the West Housing area. The 2013 IDP also identifies a lack of parking on base.

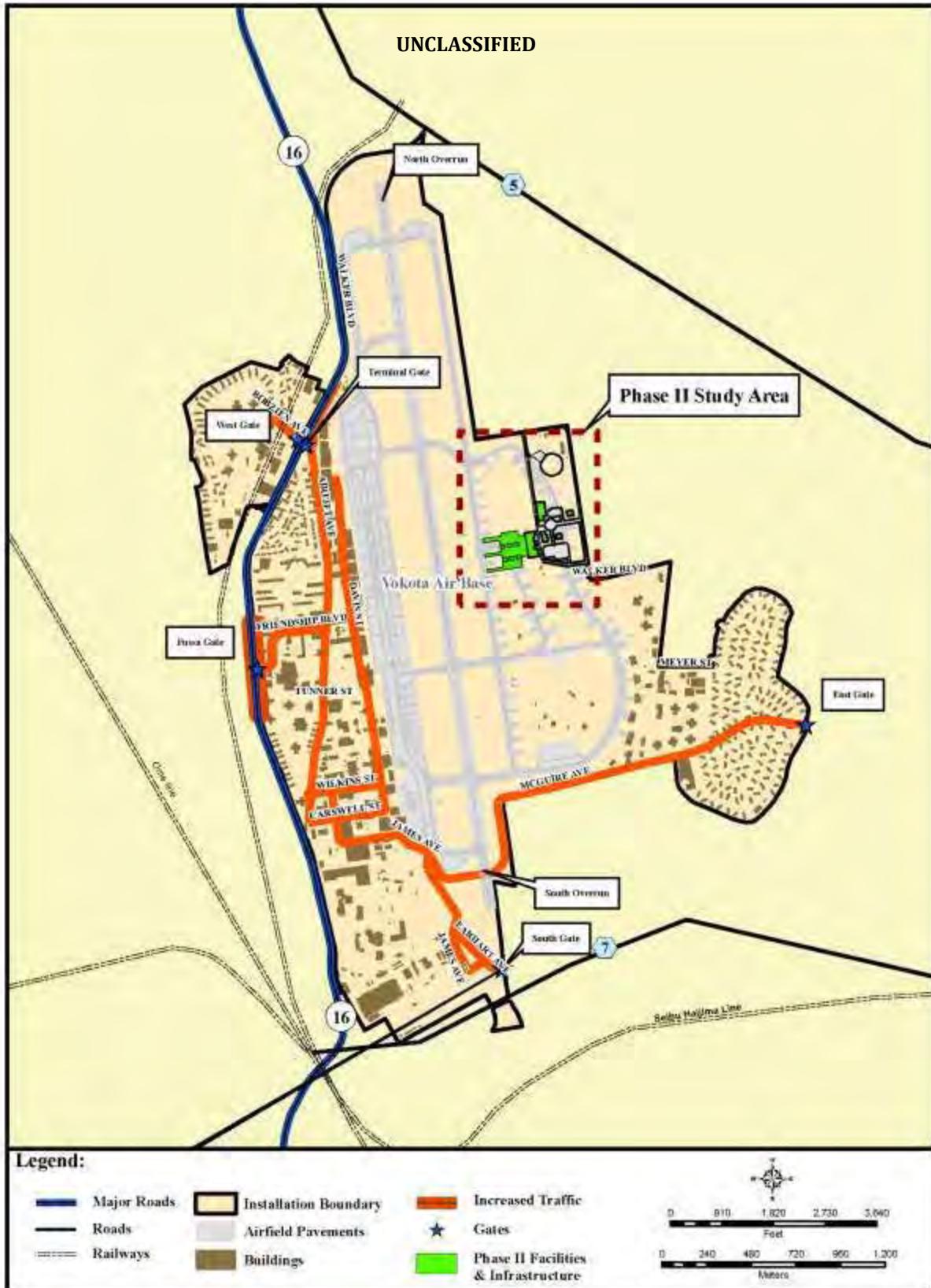
(U) According to the IDP, there is limited capacity for parking in the West Aircraft Operations Area, which encompasses the Phase I study area, but a surplus of parking capacity for East Aircraft Operations Area, which encompasses the Phase II study area.

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(U) Figure 3-8. Potentially Affected Yokota Air Base Roads and Base Gates - Phase I

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(U) Figure 3-9. Phase II Potentially Affected Yokota Air Base Roads and Base Gates

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(U) 4. ENVIRONMENTAL CONSEQUENCES

(U) 4.1 AIRSPACE

(U) 4.1.1 Proposed Action

(U) In general, aircraft assigned to YAB would continue to use currently existing training areas and ranges. The alternatives do not call for creating new airspace or changing the lateral boundaries of any military training airspace; therefore, this analysis focuses on levels of activity to ensure that airspace capacities and ATC management capabilities are not exceeded.

(U) *Training Area Operations*

(U) The CV-22 aircraft beddown would also increase the level of activity at Training Areas, including airspace use and munitions expenditures, spread out over six training areas (East Fuji Maneuver Area, Hotel, Draughon Range, existing Okinawa training ranges, Andersen Air Base, and Pil Sung Range near Osan Air Base, Republic of Korea). Munitions use would increase in at least some sites. The training, which would occur during currently approved hours, is not expected to significantly affect scheduling at the selected training areas. Also, it is anticipated that munitions use would be within accepted levels. However, AFSOC must coordinate with YAB before beddown occurred to ensure the training areas could accommodate the expected increase in operations, including munitions use.

(U) *Management Requirements*

- (U) Any additional ATC support identified by PACOM will be negotiated with AFSOC for potential, additional Host Tenant Support.
- (U) AFSOC should coordinate with YAB before beddown to ensure training areas can accommodate the increased operations.

(U) With implementation of these recommendations, there would be no significant harm to airspace under the Proposed Action.

(U) 4.1.2 Alternative 1

(U) From a mission operation standpoint, there is no difference between Alternative 1 and the Proposed Action because the number of aircraft is the same. Thus, the number of airfield operations and sorties, munitions use, and personnel increases are identical for each alternative. The same recommendations (manpower study and AFSOC coordination) identified for the Proposed Action would apply to Alternative 1. With these recommendations, there would be no significant harm to airspace under Alternative 1.

(U) 4.1.3 No Action Alternative

(U) Under the No Action Alternative, no additional aircraft would bedown at YAB. The number of ATC operations and level of Special Use Airspace use would remain unchanged

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compared to current levels. There would be no significant harm to airspace due to the No Action Alternative.

(U) 4.2 NOISE

(U) In this section, noise under the action alternatives is compared against baseline levels of noise to assess impacts. Aircraft and construction noise are considered.

(U) As discussed in Section 3.2, CNEL/L_{den} and L_{dn} can be used to predict the likelihood of members of the community becoming highly annoyed by noise. Based on numerous sociological surveys and recommendations of U.S. Federal interagency councils, the most common noise benchmark referred to is a L_{dn} of 65 dB. This threshold is often used to determine residential land use compatibility around airports, highways, or other transportation corridors. Two other average noise levels are also useful:

- **(U)** A L_{dn} of 55 dB was identified by the USEPA as a level "... requisite to protect the public health and welfare with an adequate margin of safety" (USEPA, 1974). Noise may be heard, but there is no risk to public health or welfare.
- **(U)** A L_{dn} of 75 dB is a threshold above which effects other than annoyance may occur. For example, it is also a level above which some adverse health effects, such as hearing loss, cannot be categorically discounted (Committee on Hearing, Bioacoustics, and Biomechanics [CHABA], 1977).

(U) 4.2.1 Proposed Action

(U) Airfield Vicinity

(U) There would be no significant harm from aircraft noise produced by the Proposed Action. The CV-22 is similar in noise level to aircraft which operate at YAB currently (Table 4-1). The noise level generated by CV-22 aircraft depends heavily on whether the aircraft is in "airplane" or "helicopter" mode. While travelling long distances, CV-22 aircraft are typically in airplane mode with rotor nacelles roughly parallel with the ground. When the aircraft needs to slow or come to a hover, the nacelles are tilted upwards such that the aircraft operates like a helicopter. While at an intermediate stage with nacelles tilted at 60 degrees relative to horizontal, the CV-22 generates a SEL similar to the H-1 currently based at YAB. However, the CV-22 generates a unique noise signature while flying and overflights would be expected to be noticed despite the relatively low noise level generated.

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(U) Table 4-1. Noise Levels (dB SEL) Associated With Direct Overflight of Aircraft Based at Yokota Air Base and Compared with the CV-22

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Aircraft Type	Airspeed (knots)	Power Setting	Altitude (Feet AGL)			
			500	1,000	2,000	5,000
CV-22	115	60 Degrees Nacelle Tilt	96	92	88	83
C-130H+P	170	970 CTIT	97	91	86	77
C-12	160	100 % RPM	84	79	75	68
H-1	80	80 KTS	96	91	87	79

(U) Nacelle Tilt = a primary predictor of CV-22 noise level is the degree of nacelle tilt; AGL = above ground level; CTIT = Turbine Inlet Temperature, in degrees Celsius; RPM = revolutions per minute; 80 KTS = Engine collective required to fly the aircraft at 80 knots

(U) Notes: Sound exposure level (SEL) was calculated under standard acoustic atmospheric conditions (59°F and 70 percent relative humidity) using the program SELCALC (except Advanced Acoustic Model used tilt-rotor CV-22).

(U) AFSOC CV-22 aircraft would adhere to all noise abatement procedures currently in place at YAB. Flight paths used by currently-based aircraft would also be expected to be used by the aircraft proposed to be beddown. CV-22 aircraft are similar in noise level to aircraft currently based at YAB. Aircraft noise impacts under the Proposed Action would be limited to slightly increased annoyance resulting from noise and minor vibrations induced by CV-22 overflight.

(U) Noise analysis was conducted at several representative noise-sensitive locations near the installation. As shown in Table 4-2, the highest SEL to which these locations are exposed would not change relative to existing conditions. Transient aircraft such as the C-5 use YAB on a regular basis as part of the AMC airlift mission and other missions. Several of the transient aircraft are louder than the CV-22 aircraft.

(U) Table 4-2. Noise Levels at Representative Noise-Sensitive Locations

UNCLASSIFIED					
ID #	General Description ¹	Latitude	Longitude	Baseline	Proposed
				Highest SEL ²	Highest SEL ²
1	Factory	35° 47'30.62 N	139° 20'35.71 E	112	112
2	Mizuho Nagaoka Hall	35° 46'58.79 N	139° 19'50.14 E	101	101
3	Agricultural Cooperative Mizuho Store	35° 46'37.5 N	139° 20'28.07 E	120	120
4	Hamura Daini Junior High School	35° 46'1.91 N	139° 19'17.69 E	93	93
5	Fussa Daini Junior High School	35° 35'1.30 N	139° 19'40.17 E	99	99
6	Musashimurayama Daini Elderly Welfare Hall	35° 44'58.89 N	139° 22'13.35 E	97	97
7	Fussa Daigo Elementary School	35° 43'33.36 N	139° 19'44.32 E	93	93
8	Nishisuna Elementary School	35° 43'37.77 N	139° 21'59.96 E	99	99
9	Akishima Observation	35° 43'17.1 N	139° 21'22.58 E	117	117

UNCLASSIFIED**(U) Table 4-2. Noise Levels at Representative Noise-Sensitive Locations, Cont'd**

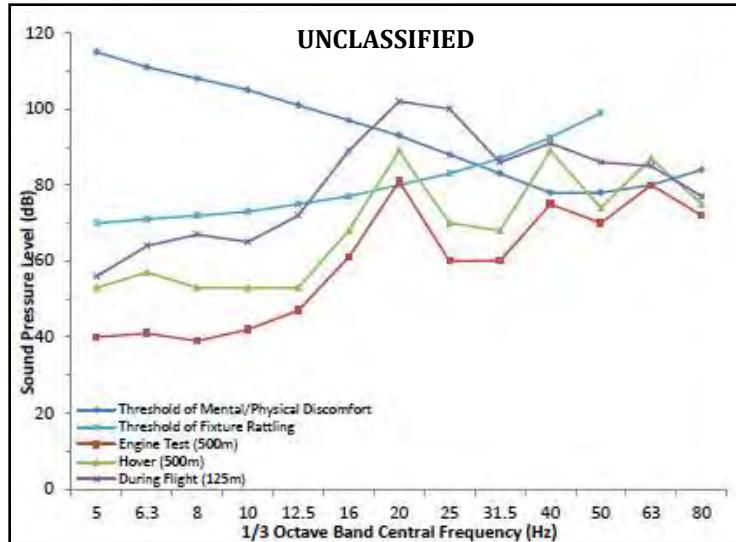
UNCLASSIFIED					
ID #	General Description ¹	Latitude	Longitude	Baseline	Proposed
				Highest SEL ²	Highest SEL ²
	Well				
10	Akishima City Hall	35° 42'17.36 N	139° 21'18.03 E	113	113
11	Nakagami Elementary School	35° 42'11.22 N	139° 22'11.32 E	100	100
12	Ishikawa Community Center	35° 40'42.8 N	139° 22'5.10 E	112	112
13	Owada Community Center	35° 39'31.92 N	139° 21'8.46 E	96	96
14	Tokyo New Town Development	35° 39'42.72 N	139° 22'32.42 E	109	109
15	Takiai Elementary School	35° 38'25.78 N	139° 22'29.50 E	107	107
16	Tokyo Metropolitan University	35° 36'51.29 N	139° 22'55.60 E	102	102

(U) dB = decibel; DNL = day-night average sound levels; SEL = sound exposure level

(U) Notes: ¹Specific points are at the approximate geographic center of the locations listed. ²“Highest SEL” is the highest SEL generated by any representative flight profiles used in noise modeling. Actual flight profiles may deviate from representative flight profiles used, and SEL noise levels experienced at the listed locations may exceed the value listed.

(U) In consideration of LFN, the ODB collected data for the Marine Corps variant MV-22 for 80 Hz and below at a site removed from the geographic region of YAB (and therefore with different climatic conditions that would potentially alter noise transmission characteristics), as described in the *Final Environmental Review for Basing MV-22 Aircraft at MCAS Futenma and Operating in Japan* (DON, 2012). Noise data were collected during engine testing and hovering at distances from the aircraft ranging from 50 to 500 meters (164 to 1,640 feet). Data were also collected directly below an MV-22 in flight at 125 meters (410 feet) altitude, although the mode of operation was not specified. The data indicated that LFN exceeded thresholds for fixture rattling and mental or physical discomfort at certain frequencies, during flight and at a distance of 500 meters to one side of the aircraft for hovering and engine testing operations (Figure 4-1). Noise levels at other distances were not provided, thereby precluding a determination of distance to which thresholds were not reached. Noise levels were also not reported for multiple directions relative to aircraft orientation. Exceedance was primarily attributed to in-flight noise, with hovering contributing to a smaller degree and engine testing contributing almost none.

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Source: DON, 2012

(U) **Figure 4-1. Low-Frequency Noise Levels, MV-22 and Okinawa Defense Bureau Thresholds**

(U) Flights to training areas are not expected to affect residential areas due to altitude of the aircraft. The CV-22 (based on operational description of the MV-22) would typically transit to training areas in airplane mode at altitude above 1,000 feet AGL. Although the effects of LFN were not reported at altitudes greater than 410 feet, it is expected that the increased height would reduce LFN effects.

(U) There would be no significant harm from construction noise from the Proposed Action. The proposed construction and renovation projects would result in minor, temporary increases in localized noise levels in the vicinity of the project areas while construction or renovation is under way (Table 4-3). It is expected that construction would be limited to normal working hours (i.e., between 700 hrs and 1700 hrs). The construction noise may be annoying to some persons. However, the noise and any resulting annoyance would be temporary, lasting only for the duration of the project. Furthermore, YAB is an active airport that normally experiences high noise levels from daily flight operations. The noise disruptions would be temporary and limited to daytime hours; therefore, any harm from noise is not considered significant.

(U) **Table 4-3. Typical Construction Equipment Sound Levels**

UNCLASSIFIED	
Equipment	Sound Level (in decibels) ¹
Backhoe	70
Clam Shovel (Dropping)	79
Concrete Mixer Truck	71
Dozer	74
Generator	69

(U) Source: U.S. Federal Highway Administration, 2006

(U) 1. Measured at 125 feet

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(U) Training Areas

(U) The CV-22 would train in several existing military training areas, as described in Chapter 2 and in accordance with current procedures and restrictions. Noise impacts at each of the training locations are described below.

(U) **Camp Fuji.** Camp Fuji has supported intensive helicopter and fixed-wing operations for many years. Military aircraft (e.g., C-130, UH-60, CH-47, and MV-22) are the main source of noise in this area totaling approximately 5,500 airfield operations annually (Navy, 2012). In this context, addition of CV-22 operations would be expected to result in no perceptible change (i.e., 3 dB or greater) in long-term time-averaged noise levels. CV-22 overflight noise is essentially the same as noise generated by the Marine Corps MV-22 using the area under baseline conditions and CV-22 flying procedures would be expected to be similar to those used by the MV-22.

(U) For Landing Zone operations, the hovering noise level measurements included in the Navy study on LFN (see Section 4.2.1) might be a reasonable indicator of LFN effects. In this mode, structural effect and physical discomfort levels were reached at 500 meters. Rotorcraft noise is highly directional, and LFN levels reaching particular thresholds would not extend to this distance in all directions. The majority of Landing Zones at Camp Fuji are greater than 500 meters from the installation boundary. The Landing Zones are currently used by a variety of rotorcraft including the MV-22.

(U) Munitions training would occur in areas where the same types of munitions are used currently (see Chapter 2). Noise levels associated with firing of .50-caliber and 7.62-mm rifles are listed in Table 4-4 at several distances offset laterally and perpendicular to the firing path. As the weapon types proposed for use by the CV-22 are the same as weapon types currently being used at the training areas, impacts would be limited to increased annoyance resulting from an incremental increase in the frequency of firing events.

(U) Table 4-4. Noise Levels (dB) Associated with Firing of .50-caliber and 7.62-mm Weapons

Munition Type	UNCLASSIFIED		
	Lateral Offset Distance to Listener		
	2,000 feet	5,000 feet	10,000 feet
.50 caliber	103	90	80
7.62 mm	94	81	72

(U) mm = millimeter

(U) **Draughon range, existing Okinawa training ranges, and Pil-Sung range.** Noise levels generated by firing of munitions types are shown in Table 4-4. These three ranges are all used currently for firing of these munitions types as well as larger munitions from aircraft. Noise generated by these training activities would be expected to have no perceptible effect (i.e., less than 3 dB) on long-term time-averaged noise levels.

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(U) 4.2.2 Alternative 1

(U) Aircraft and construction noise impacts would be nearly the same for Alternative 1 as for the Proposed Action. The number of aircraft sorties and operations, and training areas used would be the same for the Proposed Action and Alternative 1. The location but not the intensity or characteristics of construction noise would be different under Alternative 1. Thus, there would be no significant harm from aircraft or construction noise under Alternative 1.

(U) 4.2.3 No Action Alternative

(U) Under the No Action Alternative, noise levels at YAB would remain as they are currently. No changes to aircraft operations would occur relative to existing conditions, and the proposed construction projects would not occur. There would be no noise impacts under the No Action Alternative.

(U) 4.3 AIR QUALITY

(U) Air emissions associated with the project activities at YAB are calculated and evaluated for impact to the overall ROI. Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The U.S. Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of the action must be analyzed in respect to the setting of the proposed action and must be based on the relative severity of the impact.

(U) Calculated air emissions are provided for evaluation and consideration in the context of the existing and historical past mobile source air emissions at YAB in order to identify impacts. The air quality analysis focused on emissions associated with the construction activities, increased flight operations, munitions use, and the increases in personnel at the installation.

(U) A DoD-developed model, the Air Conformity Applicability Model (ACAM), which the U.S. Air Force uses for conformity evaluations, was utilized to provide a level of consistency with respect to emissions factors and calculations. Emissions associated with the Proposed Action are generated by two separate processes: facility construction and day-to-day training operations which include aircraft operations and associated AGE, munitions expenditures, and personnel commuting emissions.

(U) 4.3.1 Proposed Action

(U) Construction

(U) The Proposed Action would include grading and structure, C&D operations, construction worker trips and stationary equipment (e.g., generators and saws), mobile equipment, and architectural coatings for work associated with the construction of the new facilities. The action also includes asphalt pavement activities which tend to release VOC in relatively large quantities. The particular design and location of the facilities may evolve as the projects move

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forward, but the ACAM analysis uses square footage or acreage to determine the estimated emissions from construction projects (Section 2.1.1, Facilities Use and Construction). Graded area was estimated to be 10 percent larger than the facility footprint to allow for staging of vehicles and equipment. This provides a conservative analysis and allows for flexibility in architectural design specifics when the project has matured to that stage.

(U) As indicated in Table 4-5, the highest pollutant percentage is PM₁₀, which is approximately 89.39 tons. The vast majority of PM₁₀ emissions are associated with ground clearing and renovation activities which would be temporary and would have no lasting impact on the regional air quality. Therefore, there would be no significant impacts to air quality associated with construction activities under the Proposed Action at YAB.

(U) Table 4-5. Proposed Action Construction Emissions

UNCLASSIFIED						
Emissions (tons)						
Source Category	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Construction and Pavement	2.68	0.23	0.00	5.95	89.39	0.01

(U) CO = carbon monoxide; NO_x = nitrogen oxides; PM_{2.5} or 10 = particulate matter less than or equal to 2.5 or 10 microns in diameter, respectively; SO₂ = sulfur dioxide; VOC = volatile organic compounds

(U) Operations

(U) CV-22 operations would include munitions expenditures and an increased number of annual sorties and airfield operations. Operations would be the same under all alternatives; only the facilities configuration would differ. Therefore, munitions and aircraft operations emissions are provided in this section only.

(U) *Munitions Emissions*

(U) Criteria pollutant emissions associated with munitions expenditures during training operations would be minimal. The greatest release would be CO at a mere 0.72 ton per year (Table 4-6).

(U) Table 4-6. Proposed Action Munitions-Related Emissions

Munition Type	UNCLASSIFIED			
	CO	NO _x	PM ₁₀	SO _x
.50 caliber	518.41	45.91	0.00	0.00
7.62 mm ball	756.00	11.61	24.57	0.00
Chaff ^l	0.00	0.00	0.00	0.00
Flares (MJU-8/27)	168.00	0.00	1,176.00	0.00
TOTAL Emissions (lbs)	1,442.41	57.52	1,200.57	0.00
TOTAL Emissions (tons)	0.72	0.03	0.60	0.00

(U) CO = carbon monoxide; lbs = pounds; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur oxides

(U) l. Chaff emissions were assumed to be negligible based on Spargo, 1999.

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(U) Aircraft Operations and Personnel

(U) Aircraft and personnel (vehicle and comfort heating) emissions would have a somewhat larger increase in pollutant emissions. The highest total pollutant emission is for SO₂ which is approximately 41.29 tons annually. To provide some context from an urban region in the United States, the increase in SO₂ of 1.29 tons per year would represent a 1.28 percent increase in SO₂ from mobile sources in Miami-Dade County in Florida. Consequently, the increase in emissions from aircraft and personnel increase would not significantly affect regional air quality.

(U) Table 4-7. Proposed Action Aircraft and Personnel Emissions

UNCLASSIFIED					
Emissions (tons per year)					
Source Category	CO	NO _x	SO ₂	VOC	PM ₁₀
Aircraft ¹ and Personnel Emissions	8.50	8.34	1.29	1.93	0.18

(U) CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than or equal to 10 microns in diameter; SO₂ = sulfur dioxide; VOC = volatile organic compounds

(U) 1. Due to the lack of emission factors for the proposed aircraft, MH-53J emission factors were used.

(U) Summary

(U) Total emissions under the Proposed Action would be minimal in relation to the existing context of the base and Tokyo prefecture (Table 4-8); the highest emissions increase is 90.17 tons per year for PM10. However, as stated previously, the vast majority of PM10 emissions are associated with ground clearing and demolition activities which would be temporary and would have no lasting impact on the regional air quality. Therefore, there would be no significant harm to air quality from implementation of the Proposed Action.

(U) Table 4-8. Total Emissions Associated with the Proposed Action

UNCLASSIFIED					
Emissions (tons per year)					
Source Category	CO	NO _x	SO ₂	VOC	PM ₁₀
Aircraft Operations	8.50	8.34	1.29	1.93	0.18
Munitions	0.72	0.03	0.00	0.00	0.60
Construction and Pavement	2.68	0.23	0.00	5.95	89.39
Proposed Action	11.90	8.60	1.29	7.88	90.17

(U) CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than or equal to 10 microns in diameter; SO₂ = sulfur dioxide; VOC = volatile organic compounds

(U) 4.3.2 Alternative 1

(U) Under Alternative 1, the CV-22 beddown and associated construction projects would be implemented at YAB, consistent with the Proposed Action. However, the specific location and configuration of the facilities would be different. All of the actions would still be conducted within the ROI.

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(U) The individual pollutant emissions from construction and paving activities under Alternative 1 are the same as those of the Proposed Action, and would be nominal (Table 4-9).

(U) Table 4-9. Alternative 1 Construction Emissions

UNCLASSIFIED						
Emissions (tons per year)						
Source Category	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Construction and Pavement	2.68	0.23	0.00	5.95	89.39	0.01

(U) CO = carbon monoxide; NO_x = nitrogen oxides; PM_{2.5 or 10} = particulate matter less than or equal to 2.5 or 10 microns in diameter, respectively; SO₂ = sulfur dioxide; VOC = volatile organic compounds

(U) Operations

(U) Air emissions resulting from operations (including munitions expenditures, flight operations, and AFSOC personnel commutes) would be the same as discussed for the Proposed Action.

(U) Summary

(U) Total emissions under Alternative 1 (Table 4-10) are only slightly lower than those associated with the Proposed Action, and would be minimal with respect to the regional context and intensity. As with the Proposed Action, the highest increase in emissions (CO) would be associated with aircraft operations, but would be considered insignificant in the context of a heavily populated urban region and compared to historical flight operations levels at YAB. Therefore, there would be no impacts to air quality from implementation of Alternative 1.

(U) Table 4-10. Total Emissions Associated with Alternative 1

UNCLASSIFIED					
Emissions (tons per year)					
Source Category	CO	NO _x	SO ₂	VOC	PM ₁₀
Aircraft Operations	8.50	8.34	1.29	1.93	0.18
Munitions	0.72	0.03	0.00	0.00	0.60
Construction and Pavement	2.45	0.21	0.00	5.46	89.38
Total Alternative 1	11.67	8.58	1.29	7.39	90.16

(U) CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than or equal to 10 microns in diameter; SO₂ = sulfur dioxide; VOC = volatile organic compounds

(U) 4.3.3 No Action Alternative

(U) Under the No Action Alternative, AFSOC would not beddown the CV-22 System at YAB. As a result, there would be no additional construction or operational emissions or impacts anticipated, and emissions in the ROI would remain at or near the baseline levels.

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(U) 4.4 SAFETY

(U) AFSOC is sensitive to safety issues related to military aircraft operations. This section provides an evaluation of potential safety issues resulting from the CV-22 beddown and associated airfield operations, munitions use, and renovation and construction actions. The beddown and associated actions would be considered to have a significant effect on safety if they resulted in unmanageable increases in risks to military personnel or civilian populations. Analysis of applicable issues under each alternative is provided below.

(U) 4.4.1 Proposed Action

(U) Flight Safety

(U) The potential for bird-aircraft or wildlife strikes would increase due to the addition of aircraft and increased flight operations. However, the overall threat to aircraft, aircrews, and civilian populations is not anticipated to be significantly greater than that of current levels. CV-22 aircrews operating in YAB airspace would be required to follow applicable procedures outlined in the YAB BASH Plan (YAB, 2012b). Base personnel are familiar with the general seasonal and daily bird occurrence patterns and have developed procedures that are designed to minimize the potential for bird/wildlife-aircraft strikes. When conditions are such that risk is increased, limits are placed on the types of flight operations that may be conducted (e.g., takeoffs, multiple approaches), depending on the severity of the risk. Personnel with 374 OSS/OSAT and, when appropriate, 374 OSS/OSAR provide BWC information to pilots. All new aircraft would be subject to existing procedures. Therefore, no significant harm would occur due to BASH issues.

(U) An increase in air operations would potentially increase the likelihood for a safety mishap. However, the base has a Mid-Air Collision Avoidance (MACA) program in place, and hosts an annual MACA conference to build relationships with local VFR pilots and keep them informed of issues and changes associated with base operations. With these measures in place, there would be no significant harm to safety.

(U) Ground Safety

(U) All Phase I and Phase II project locations are outside the base's current QD arcs (Figure 3-6). Thus, there are no QD arc concerns with the Proposed Action.

(U) As part of readiness and training operations, CV-22 aircrews would use chaff and flares and CV-22s would expend 7.62-mm and .50-caliber ammunition. All munitions (including ammunition, chaff, and flares) would be handled and stored in accordance with Air Force and DDESB explosive safety directives. All munitions handling would be carried out in specified areas by trained, qualified personnel using Air Force-approved technical data for the specific type of ordnance. Munitions storage and handling would not result in any greater safety risk, and no significant harm related to explosives safety would occur as a result of the CV-22 beddown.

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(U) UXO could potentially be encountered during construction activities at which time work activities would immediately cease and the items would be reported to explosive ordnance disposal personnel. The Air Force would determine the appropriate actions to be taken in order to protect military and civilian personnel from accidental detonations.

(U) 4.4.2 Alternative 1

(U) The only difference between the Proposed Action and Alternative 1 is the location of Phase I facilities. Therefore, flight safety considerations would be the same for Alternative 1 as for the Proposed Action.

(U) Locations of the Alternative 1 Phase I facilities as well as proposed Phase II actions are outside established QD arcs. Thus, there are no QD arc concerns with Alternative 1.

(U) All munitions (including ammunition, chaff, and flares) would be handled and stored in accordance with Air Force and DDESB explosive safety directives. All munitions handling would be carried out in specified areas by trained, qualified personnel using Air Force-approved technical data for the specific type of ordnance. There would be no significant harm related to explosives safety as a result of the CV-22 beddown. UXO could potentially be encountered during construction activities. In such cases, work would be stopped immediately and the items would be reported to base UXO personnel who would determine the appropriate actions to be taken.

(U) 4.4.3 No Action Alternative

(U) Under the No Action Alternative, YAB operations would continue at the current level. No new aircraft would be introduced to the base. The existing aircraft would continue to be based at YAB, and safety conditions around the base airfield would remain unchanged. There would be no significant harm resulting from safety issues under the No Action Alternative.

(U) 4.5 UTILITIES

(U) 4.5.1 Proposed Action

(U) Water Supply

(U) Existing water lines located near all construction sites would be avoided during construction; therefore, impacts to existing water supply pipelines are not anticipated. Temporary increases in water demand would occur for the duration of construction, but the temporary increased water demand for construction workers' personal needs, dust control and other construction uses would not be expected to impact the water supply. For the long term, however, the permanence of Phase II operations would inevitably place a permanent increased demand on the base water supply as well as decrease water pressure which is already a problem for fire protection system and operation on the base.

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(U) Wastewater Treatment

(U) Existing wastewater lines are near Phase I projects and Interim Parking Area, but would be avoided during construction of new and renovated buildings; therefore impacts to these lines are not anticipated. There would be a minimal short-term increase in demand for sewage treatment during construction. Typically portable toilets would be available during the construction, and waste would be transported to a nearby approved wastewater treatment facility for proper disposal. The same impact and considerations would apply to the projects to follow in Phase II except the increase of sewage treatment from permanent facilities would be tied into an existing lift station near the gate to convey waste to the municipal treatment facility.

(U) Electrical Supply

(U) Electrical supply and distribution are not expected to be impacted by Phase I or II infrastructure projects and would temporarily rely on the existing power supplied from the West substations of the base. Phase I projects on the west side of the airfield would only require temporary electrical supply from existing buildings or temporary connection to the West substations until Phase II projects were completed. Eventually, Phase I structures would be abandoned as Phase II projects are completed and all CV-22 operations are moved to the east side of the base.

(U) Electrical needs for new facilities of Phase II projects, would come from the new east substation currently being built by the Japanese, which runs through the housing area and will follow the fence line of the base.

(U) HVAC Systems

(U) Proposed Phase I infrastructure projects would not impact HVAC systems at existing buildings and renovated buildings, as there is existing utility. Phase II operation facilities would require permanent heating and cool solutions but without HVAC in the existing infrastructure, satellite boilers would be necessary for heating and cooling.

(U) Communications

(U) Telephone service would not be expected to be disrupted or impacted during Phase I construction as service is already provided in the existing buildings and any new connection would be run overhead with power lines. Likewise, telephone service could be provided to permanent Phase II operation and maintenance facilities and would run along power line routes.

(U) No disruption to existing fiber optic lines is anticipated during construction. Any fiber optic route for Phase I operation facilities would connect to an existing conduit/duct bank along Walker Boulevard. Similarly, the fiber optic routes for Phase II would be connected to the existing fiber optic system on the east side of the airfield.

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(U) Natural Gas

(U) Natural Gas service or lines are not located near the Proposed Action sites of Phases I and II; therefore, no disruption to natural gas lines is anticipated during construction.

(U) 4.5.2 Alternative 1

(U) No harmful impacts are anticipated from Alternative 1 actions concerning utilities. The alternative facility configuration for Phase I projects makes no difference in the existing capacity and the location of the water supply, wastewater treatment, electrical supply, communications or natural gas.

(U) 4.5.3 No Action Alternative

(U) The No Action Alternative would not harm the existing utilities at YAB; however, water storage capacity and pressure for fire protection would remain inadequate and limit future operations and development.

(U) 4.6 HAZARDOUS MATERIALS/WASTE AND SOLID WASTE

(U) The Air Force considers a project to have a significant effect on the environment if it causes a substantial increase in the amount of hazardous material, hazardous waste, or solid waste generated, such that the existing system of procurement, management, distribution, use, and disposal is inadequate to safely accommodate the additional materials. Such a scenario could create potentially hazardous conditions for base inhabitants, the local population, and the environment. Potential issues related to hazardous materials and various wastes under the proposed actions could result from facility renovation, construction of new facilities and pavement, increased use of POLs and other materials associated with new aircraft, and increased solid waste generation. Analysis of applicable issues under each alternative is provided below.

(U) 4.6.1 Proposed Action

(U) The Proposed Action would involve modification and renovation of existing facilities during Phase I (Building 584 and Hangars 1 and 102). During Phase I renovations, there is a potential for workers to encounter hazardous materials including asbestos, PCBs, and lead paint. Asbestos surveys of the facilities would be required before major renovation activities as outlined in the installation's asbestos management plan. The plan provides the sampling status of selected base facilities. Two of the existing facilities included in Phase I have been sampled, while information is not provided for the third (Table 4-11). If activities affect portions of Building 584 containing asbestos, or if asbestos is detected at the other facilities, the projects would be subject to the requirements of applicable YAB policies and Chapter 15 of the JEGS. Required actions would include, at a minimum, formulation and review of abatement and safety procedures.

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(U) **Table 4-11. Asbestos Sampling Results – Proposed Action**

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Building/Facility Number	Asbestos Sampling Status
Building 584	Present/Detected
Hangar 102	Not Sampled
Hangar 1	Information not provided

(U) Source: YAB, 2010a

(U) Renovation activities could result in encounters with PCBs, which may be present in electrical devices (transformers, capacitors, etc.) or other items (see Section 3.6.3) due to their fire retardant characteristics. If present, management and disposal of PCB-containing items would be conducted according to the JEGS and the base's PCB management plan. Electrical transformers containing PCBs are generally sent back to the U.S. for disposal. However, if the transformers were manufactured in Japan, the base must store them until a waiver is obtained from the USEPA. If renovation resulted in removal of transformers, 374 CES/CEIE would need to develop and implement a storage management plan.

(U) Phase I renovation actions should also be reviewed by 374 CES/CEIE to determine the possible occurrence of lead-based paint. If occurrence is unknown, an assessment would be conducted prior to initiating activities. If lead-based paint is found, removal and cleanup would be conducted in accordance with YAB policies and Chapter 17 of the JEGS.

(U) Above-ground storage tanks are located in the vicinity of project locations on the western side of the runway (Figure 3-7) but would not be affected by the proposed activities. Ground-disturbing construction activities have the potential to affect underground fuel lines, and contaminated soil could be encountered as well. Active fuel lines occur near the site proposed for construction of the modular Squadron Operations building and parking lot (Phase I), but they would not be directly affected. Active fuel lines occur directly beneath the proposed interim parking sites. Contact with these lines would be avoided during construction to the greatest extent possible. However, if accidental damage occurred, any spills would be managed according to the base's spill prevention and response plan. Abandoned fuel lines occur near and in some cases directly beneath proposed new construction sites associated with Phase II. It is unknown whether or not the abandoned lines have been purged of fuel. If sections of the abandoned lines conflict with new construction, they would be cut and removed, with the remaining line capped and left in place.

(U) The base does not maintain inventories of POL or hazardous waste spill sites. Also, because the JEGS do not contain formal soil or groundwater cleanup requirements, the base does not have ongoing cleanup or remediation sites (YAB, 2013). Contaminated soils are therefore unknown at the proposed construction areas. However, the potential exists to encounter soil affected by undocumented historical releases of POL or other substances at or near the sites. There is a possibility that fuel could have leaked into the soil from the abandoned lines, or have been spilled during previous fueling operations. In addition, contaminants at other locations on the installation could potentially migrate through groundwater movement. Petroleum products have been detected in soil and groundwater samples at numerous bore locations within the POL Yard (AFCEE, 2005). Investigation, and possibly remediation and management actions, would

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be required if ground-disturbing activities result in visual or odor cues indicating potential soil contamination. Any such cues should be reported immediately to 374 CES/CEIE.

(U) Increased use of hazardous materials and generation of hazardous wastes would occur under the Proposed Action. The increases would occur within Phase I and Phase II timeframes. In the short term, construction-related activities would result in hazardous materials and wastes, potentially including equipment fuel, engine oil, hydraulic oil, grease, and other equipment operation and maintenance materials. In addition, hazardous materials would be required to treat the airfield surfaces exposed to CV-22 exhaust heat. In the long-term, operation and maintenance of CV-22 aircraft would likely generate materials and wastes similar to those related to construction, in addition to other materials (paint, etc.). The increased number of aircraft would result in increased fuel requirements. New fuel lines could be required east of the airfield, or alternatively, abandoned lines could be re-activated. One or more new ASTs would also likely be installed near new facilities east of the airfield, and new oil-water separators would be required. Oil water separators are only permissible at wash rack locations.

(U) If not managed properly, POLs and other materials could pose a hazard by entering soil and groundwater. For example, apparent soil contamination has been observed at several AST sites, probably due to improper filling and service operations (YAB, 2010b). Other general tank deficiencies noted include non-compliant markers and signs, records, corrosion protection, secondary containment, emergency vents, and drain valve securement. Assessments of the base's environmental programs identified a number of compliance and minor findings related to management of hazardous material/waste, POL, pesticides, and other items (YAB, 2012e; YAB, 2012f). Therefore, all hazardous materials and wastes should be managed in accordance with the JEGS and applicable YAB policies.

(U) Hazardous materials would be procured, stored, managed, used, and disposed of according to the JEGS and the base's *Hazardous Material Management Plan & Ozone Depleting Substances Management Plan*. Similarly, hazardous waste would be managed in accordance with requirements of the JEGS and the base's HWMP. The installation's hazardous waste system is currently operating under capacity and is considered adequate to support increases associated with the Proposed Action. If any new hazardous materials were introduced to the base, including munitions, IAPs and waste stream monitoring would be implemented. Any new management system would be integrated into the base's Environmental Management System. If there were significant increases in quantity, personnel additions could be necessary. Fuel lines and ASTs would be installed and operated consistent with the base's *Spill Prevention and Response Plan* and *Storage Tank Management Action Plan*.

(U) Similar to hazardous materials and waste, short-term and long-term increases in solid waste would occur under the Proposed Action. Construction debris would be generated during all phases of the action. Debris includes materials such as wood, concrete, asphalt, metals, roofing materials, drywall, and other materials. Construction contractors are required to remove all debris from the installation, where it becomes subject to Japanese environmental and recycling laws such as the Construction Material Recycling Act. It is expected that most, although probably not all, construction debris would be recycled; according to base personnel, approximately 98 percent of construction debris generated in 2009 was recycled. However, the

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volume of off-base disposal of debris is currently not consistently reported to the installation's P2 manager. Contractors would be required to report all such materials generated as a result of implementing the Proposed Action. Contractors would obtain an inventory form from the Environmental Element (374 CES/CEIE) to document the amount and type of materials recycled.

(U) In the long term, solid waste generated on the installation would increase due to the addition of personnel and dependents. In accordance with the base's ISWMP, solid waste would be diverted to the extent practicable. Waste that is not diverted would be incinerated or transported to an off-base landfill. Little solid waste is currently transported off the base. Therefore, although the amount of generated waste would increase, it is not expected to significantly harm on-base or off-base environments. However, the increase could negatively affect the installation's 65 percent waste diversion goal.

(U) Management Requirements

- (U) Ensure that all actions are conducted in accordance with the JEGS, AFI 32-7042, the *Hazardous Waste Management Plan, Hazardous Material Management Plan & Ozone Depleting Substances Management Plan, Spill Prevention and Response Plan*, and all other applicable policies and regulations described in Section 3.6.2, Policies and Regulations.
- (U) Conduct surveys for asbestos, PCBs, and lead paint before renovation or repair of existing structures.
- (U) Ensure that debris generated by construction contractors is reported to the base P2 manager.

(U) 4.6.2 Alternative 1

(U) Compared to the Proposed Action, Alternative 1 would involve renovation of Building 79 instead of Building 584 during Phase I; additionally, the modular building and associated parking area would not be constructed. All other actions would be the same, including new Phase II project construction and aircraft beddown. Therefore, the resulting types and quantities of hazardous material, hazardous waste, and solid debris generated would be the same. All hazardous materials, waste, and debris would be managed according to the JEGS and applicable YAB plans and policies. Asbestos is known to be present in at least a portion of Building 79 (Table 4-12). If renovation activities would result in contact with asbestos, the project would be subject to the requirements of applicable YAB policies and Chapter 15 of the JEGS.

(U) Table 4-12. Asbestos Sampling Results – Alternative 1

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Building/Facility Number	Asbestos Sampling Status
Building 79	Present/Detected

(U) Source: YAB, 2010a

(U) With implementation of the management requirements provided under the Proposed Action, there would be no significant harm to the environment resulting from Alternative 1.

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(U) 4.6.3 No Action Alternative

(U) Under the No Action Alternative, the proposed actions would not take place. Hazardous material, hazardous waste, and solid waste generation and management would be unchanged from the current baseline conditions. There would be no significant harm to the environment resulting from the No Action Alternative.

(U) 4.7 WATER RESOURCES

(U) The Proposed Action would result in significant harm to water resources if project construction directly altered water flow or water levels in surface waters or wetlands or reduced water quality in these systems and/or the groundwater by contaminants transported by stormwater.

(U) The JEGS provide criteria for managing wastewater effluent and the quality of drinking water but do not specifically list water quality criteria for natural systems. General guidance for water resources is as follows:

- JEGS 13-5.1 states “where feasible, wetlands, floodplains and drainage ways should not be used for facilities development but should be used for open space and recreation” (U.S. Forces, Japan, 2006).
- JEGS 13-5.2 states that to prevent the transport and discharge of silt into surface waters, installation should implement erosion and sediment control measures, to include use of vegetative cover, diversion drains, grading management, filter strips, and sediment basins.

(U) The base SWPPP states “stormwater should not be intentionally routed to natural wetlands without pre-treatment due to the potentially damaging effects that runoff can have on natural wetland systems. In addition, natural wetlands that receive stormwater should be evaluated to determine if the runoff is causing degradation of the wetland, and if so, measures should be taken to protect the wetland from further degradation and to repair any damage that has been done” (374 Airlift Wing, 2012).

(U) 4.7.1 Proposed Action

(U) Water resources (surface water, groundwater or stormwater) would not be harmed at YAB as a direct or indirect impact of the Proposed Actions of Phase I infrastructure projects, including the repair of the Taxiway Alpha parking.

(U) The Air Force does not anticipate direct harm to groundwater by projects in Phase I or II. Trenching and excavation for new construction would not penetrate the water table of the surficial aquifer, which is located between 35 feet and 50 feet below ground surface (bgs).

(U) The increase in impervious surface area of new buildings and parking would be a fraction of the total impervious surface area of the main base, thus, no appreciable increase in stormwater runoff would occur. Sediment contamination in stormwater through erosive forces like wind and

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rain would be captured by the implemented best management practices (BMPs) and the existing storm sewer system before entering off-base receiving water bodies which are monitored for water quality, as stated in the YAB SWPPP (374 Airlift Wing, 2012). Additionally, spill collection and oil and water separators would be employed in order to prevent any spilled fuel from entering the base stormwater collection facilities. The observance of construction BMPs and oil and water separator maintenance would minimize any additional potential for harm to surface water resources.

(U) Similarly, the Proposed Actions of Phase II infrastructure projects including new aircraft parking would not cause significant harm to water resources (surface water, groundwater, and stormwater). The location of Phase II construction sites is on the east side of the airfield which is semi-improved with existing airfield pavement, unpaved airfield, and a few operations and maintenance buildings. New construction for both phases would remove negligible amounts of existing vegetation. All construction actions would follow policies and procedures outlined in the SWPPP to minimize the potential for impacts to drainage features on and off base. Final design of any construction would accommodate surface water drainage to the existing stormwater sewage system.

(U) 4.7.2 Alternative 1

(U) No significant harm is anticipated to YAB water resources (groundwater, surface water and stormwater) by the Alternative 1 Phase I or II actions, because the only difference from the Proposed Action is the location of an alternate facility configuration, which is in the same vicinity of base as the Proposed Action.

(U) 4.7.3 No Action Alternative

(U) No harm is expected to YAB water resources if no action is to occur. No ground disturbing activities associated with new construction or renovations or airfield repairs would occur. The stormwater sewer system is described as satisfactory for existing conditions.

(U) 4.8 BIOLOGICAL RESOURCES

(U) This section provides an evaluation of potential adverse effects to biological resources resulting from the CV-22 beddown at YAB, along with the associated renovation and construction actions. The JEGS define adverse effects as changes that diminish the quality or significant value of natural resources. For biological resources, adverse effects include significant decreases in overall population diversity, abundance, and fitness. Potential types of harm that could result to biological resources include habitat removal, direct physical impacts to individual plants or trees, and disturbance of wildlife due to noise and human presence.

(U) 4.8.1 Proposed Action

(U) Construction

(U) Phase I activities, which consist of renovating existing facilities, constructing a modular building and associated parking lot, and constructing CV-22 interim parking, would occur within

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the heavily developed western portion of the base (Figure 2-1). Renovation of the existing hangars would involve only a minor amount of ground disturbance and little to no vegetation removal. The modular building and parking lot construction sites are primarily paved, with some maintained grass and a few trees present. The grass would be removed due to parking area construction, but trees that have cultural significance, such as cherry trees, may be left in place. Interim CV-22 parking construction would affect existing pavement only and would not disturb or cause removal of any vegetation. The areas affected by Phase I projects do not likely function as important wildlife habitat due to ongoing human activity, previous landscape alteration, and fragmentation. Wildlife occurrence is probably limited to those species typically found in urban environments and accustomed to human presence and noise, such as some bird and small mammal species. Protected plant and animal species are not known in this area. Phase I activities would not significantly affect vegetation or wildlife populations.

(U) Phase II actions would consist of new construction, including a large area of airfield pavement, in the eastern portion of the installation (Figure 2-2). Vegetation in the project areas consists primarily of maintained grass and other herbaceous ground cover, along with a small number of trees near the project sites. The area is zoned for industrial use. However, wildlife species including birds, reptiles, and small mammals (rodents, etc.) likely occur at and near the project areas due to the open landscape and the presence of off-base agricultural fields located adjacent to the sites. The 1999 biodiversity survey reports that the eastern perimeter area, which is adjacent to and in some areas overlaps the proposed sites (Figure 4-2), is one of three important bird habitat areas on the base, having the second highest bird density and the highest number of species recorded. A variety of birds, including raptors, insectivores, and seed-eating species, may occur. Relatively elevated numbers of migratory birds were reported in this area during the survey.

(U) Protected plant and animal species have potential occurrence within or near the Phase II project sites. Although site surveys have not been conducted specifically for this ER, the plant species *Potentilla nipponica* has been documented previously on YAB near the Proposed Action location (YAB, 2006). The Eurasian kestrel and house swift were recorded in the eastern perimeter area during 1999 surveys. The goshawk typically occupies forest edge habitat next to open fields, but has been observed on grasslands in the runway area and probably uses the area to forage. Peregrine falcons hunt within a variety of habitats, including woodlands and farmlands, and could potentially occur in the area. The red fox likely uses the area to forage for a variety of food items.

(U) During construction, wildlife disturbed by noise and construction-related activities would likely avoid the affected areas. This could include protected species (birds and the red fox). After completion of the projects, wildlife could continue to avoid the area to some extent due to increased human presence and activity. Grass and other herbaceous ground cover would be removed due to placement of Phase II facilities and structures, and would therefore not be available for future use by wildlife. The maintained grass is not considered quality habitat and is not likely significant to wildlife populations in the region. Other similar habitat is available on and near the base for use by birds, red fox, and other wildlife species.

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(U) Figure 4-2. Important Bird Habitat Areas

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(U) The JEGS require that installations take reasonable steps to protect and enhance endangered, threatened, or otherwise protected species and their habitats. Accordingly, site surveys would be conducted before construction activities begin. Relocation of any protected plant species found would be required before initiation of ground-disturbing activities. Relocation efforts would be coordinated by 374 CES/CEIE. Trees would be avoided if practicable. If trees of natural or cultural significance could not be avoided, they would be relocated if feasible (depending on factors such as species and diameter). Relocation sites would be compatible with the physiological requirements of the particular species.

(U) Airfield Operations

(U) After Phase II construction projects are complete, airfield operations would result in increased average noise levels near the new airfield pavement. Increased noise could impact wildlife in the vicinity by causing startle effects or long-term avoidance of the area. However, day-night noise levels would not increase significantly (see Section 4.2, Noise). In addition, wildlife within or near the proposed sites are likely acclimated to noise to some degree because of ongoing airfield operations under existing conditions.

(U) Ground-nesting birds could be affected if nests were located in airfield areas subject to rotor wash of the CV-22. However, it is expected that only a small portion of any ground-nesting bird population would be located in such areas. After the initial beddown, birds would likely be deterred from nesting near the airfield due to ongoing operations and disturbance, and would nest in other locations.

(U) In summary, with appropriate management actions in place, it is not anticipated that implementation of the Proposed Action would result in significant decreases in overall vegetation or wildlife population diversity, abundance, or fitness. There would be no significant harm to biological resources. The following management actions would be required as part of the Proposed Action, in order to comply with the JEGS' requirement to protect and enhance endangered, threatened, or otherwise protected species and their habitats.

- (U) Before (Phase II) actions begin, conduct site surveys for the presence of protected plant species and for the presence of trees.
- (U) If found, relocate any protected plant species that would be impacted by construction activities.
- (U) Avoid impacts to trees to the extent practicable.
- (U) Relocate any trees with natural or cultural significance that would be impacted by construction activities, as feasible; relocation sites would be compatible with the species' physical requirements.

(U) 4.8.2 Alternative 1

(U) Impacts to biological resources resulting from Phase II projects would be the same as those described under the Proposed Action, as these elements are identical under each alternative. For Phase I actions, the only differences are that Building 79 would be renovated (as opposed to Building 584), and no modular buildings or parking areas would be constructed.

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Hangar 1 and Hangar 102 would also be used, similar to the Proposed Action. The project sites, although in a slightly different location, would still be located in the heavily developed western portion of the base. Building 79 is surrounded by pavement; no vegetation would be disturbed due to renovation activities. Wildlife occurrence is likely limited to species typically found in urban environments and accustomed to human presence and noise. Protected plant and animal species are not known in the area. Actions would not result in significant decreases in overall vegetation or wildlife population diversity, abundance, or fitness. There would be no significant harm to biological resources under Alternative 1.

(U) 4.8.3 No Action Alternative

(U) Under the No Action Alternative, there would be no facilities construction, placement of new airfield pavement, or aircraft beddown. Noise levels would not change due to increased airfield operations. There would therefore be no impacts to vegetation or wildlife species, including protected species. There would be no significant harm to biological resources under the No Action Alternative.

(U) 4.9 CULTURAL RESOURCES

(U) Significance and Cultural Property compliance criteria are discussed in Chapter 12.3 of the JEGS (U.S. Forces Japan, 2012) and Chapter 4.2 of the YAB ICRMP (Verhaaren, 2007). These significance and compliance criteria include guidelines for the protection and systematic investigation of cultural resources located on YAB. AFSOC considers a project to have an adverse effect on cultural resources if it affects cultural properties at YAB that are of potential historic or cultural significance to the installation or host nation; affects any property listed on the World Heritage List or Council for the Protection of Cultural Properties designated list in Japan or involves action where personnel excavate, disturb, harm, possess, sell, trade or remove historic or cultural resources (including human remains) without permission of the host nation and installation commander. If not previously inventoried resources are discovered in the course of a DoD action, the newly discovered items would be preserved and protected pending a decision on final disposition by the installation commander after coordination with the appropriate government of Japan officials (such as the local boards of education).

(U) 4.9.1 Proposed Action

(U) As per section C12.3.7 of the JEGS (U.S. Forces Japan, 2012), installation commanders require that any planning for major actions will consider possible effects on historic or cultural resources. With that consideration, implementation of the Proposed Action would potentially result in significant harm to known cultural properties. Building 102 is proposed for use as a maintenance hangar/AMU. Interior improvements of this hangar are required, in order to adaptively reuse the facility to meet current mission needs. As modifications to the structure have the potential to harm the historic characteristics of this structure specific steps are required prior to adaptive reuse. These steps involve mitigative efforts such as studies directed by the Cultural Resource Manager, 374 AW/HO or ensuring that the adaptive reuse efforts retain original structural elements, if feasible. If mission requirements render the retention of original

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elements impractical, they should be replaced with materials that match the style of the original features.

(U) Adaptive reuse is the recommended course of action for all historically significant structures. When modifications are required, appropriate steps contained in the YAB ICRMP (Verhaaren, 2007) should be taken. As per the ICRMP (Verhaaren, 2007) Section 3.3.1:

(U) ...Particular attention should be paid to historically authentic features. If mission or development plans mandate that these structures be modified or demolished, local boards of education should be allowed the opportunity to study and record the original structures before they are altered.

(U) The Fussa City Board of Education has expressed interest in structures from the SCAP era and is typically given the opportunity to study and record structures from this period that are scheduled for demolition or remodeling (Verhaaren, 2007). Additional evaluative or recordation steps may be required by YAB in the event the Board of Education (BOE) does not choose to record the structure.

(U) Due to previous development, there is a low likelihood of intact archaeological deposits. There are no known archaeological resources within the project area. However, as per the YAB ICRMP, “At [Yokota], if there are no known resources affected and the project does not include excavation exceeding 1m (39 in.) in depth, no adverse effect is anticipated. If the project includes excavation of more than 1 m (39 in.), deep testing or monitoring will be required.”

(U) Any discovery of undocumented cultural resources would force work on the Proposed Action to cease and the appropriate actions described in the base ICRMP and JEGS would be followed. Inadvertent discoveries of cultural resources are covered under Section 12-3.8 of the JEGS (U.S. Forces Japan, 2010) and Sections 3.3.5, 4.2.1, and 4.2.2 of the base ICRMP (Verhaaren, 2007).

(U) 4.9.2 Alternative 1

(U) Implementation of Alternative 1 would potentially result in significant harm to known cultural properties. Specific effects to cultural resources and required mitigation for Alternative 1 would be the same as under the Proposed Action.

(U) 4.9.3 No Action Alternative

(U) The No Action alternative is included as a baseline and means that the Proposed Action would not take place and that AFSOC would not beddown the proposed CV-22. Under the No Action alternative no harm to cultural properties would be anticipated.

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(U) 4.10 TRANSPORTATION

(U) 4.10.1 Proposed Action

(U) Transportation impacts as a result of implementing the Proposed Action would be considered “significant” if a discontinuation of safe vehicle operating conditions occurred on regional or base roadways or gates affected by the Phase I and Phase II actions.

(U) Based on the number of military and other personnel that could be added during Phase I and Phase II a reasonable number of additional vehicles from the beddown can be estimated. The actual timing of manpower changes depends on approved force structure and/or strategic basing decisions. The analysis followed the “Two Car Maximum Rule” for Yokota, meaning one four-wheel vehicle per licensed driver and a maximum of two four-wheeled vehicles per household (374 Airlift Wing Safety, 2009). Thus, the analysis assumed that each unaccompanied person represents one vehicle and each accompanied person represents a maximum of two vehicles. For the purposes of analysis, accompanied personnel were assumed to comprise 57 percent of the total incoming military and civilian personnel; unaccompanied personnel were assumed to comprise 43 percent of the total. Table 4-13 lists the number of anticipated vehicles that would be introduced over the phases of the beddown.

(U) Table 4-13. Estimated Vehicle Increase Under the Proposed Action

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Phase	Fiscal Year	Accompanied Personnel	Estimated Number of Vehicles	Unaccompanied Personnel	Estimated Number of Vehicles	Total Estimated Number of Vehicles
Operations Squadron	2015	45	90	34	34	124
Maintenance	2018–2022	159	318	120	120	438
Group HQ/Operations Support Overhead	2022	19	38	14	14	52
Total		223	446	168	168	614

(U) Based on the analysis it is anticipated that there would be approximately 614 additional vehicles upon completion of the beddown. There are no traffic studies specific to the Proposed Action; however there is a study that offers a meaningful comparison to the average vehicle increase per beddown phase. The JASDF Traffic Study of 2010 estimated a final increase of 525 vehicles to base traffic (U.S. Air Force, 2010). The study concluded that without some modifications to some of the affected intersections, traffic delays would be “significant.” This ER defines significant harm to transportation differently, meaning vehicle increases or other changes that result in unsafe transportation conditions.

(U) The average vehicle increase per phase of the Proposed Action would be approximately 307, thus some inferences on potential issues may be drawn with respect to increased traffic on affected roads especially since there are some roadways in common between the JASDF action and the Proposed Action. There would be an added burden to currently available vehicle parking space. Increased volume of cars would potentially affect refueling time efficiency as well as base shuttle operations. There would be an increase in AM/PM gate activity as some incoming

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personnel would live off base. The exact number of future off-base personnel is unknown but is expected to be a small percentage of the total. Those living off base would be assumed to enter/exit through a number of gates and not add significantly to current traffic delays at any one gate access.

(U) Thus, in comparison to the JASDF action, the impact felt in any one year from the increased number of vehicles would be comparatively less with the Proposed Action. There would be increased traffic along certain key roads leading to and from base housing, the north and south overruns and within the Phase I and possibly the Phase II project areas. Traffic can back up at the north and south overruns when aircraft are taking off and landing. Increasing the number of sorties would likely increase the frequency of the backups at the north and south overruns. However, the issue with the overruns is expected to be remedied. The 2013 YAB IDP future transportation plan identifies a realignment of Walker Boulevard to rectify the north overrun situation. To alleviate the south overrun traffic issues the base plans to demolish and remove McGuire Avenue from the south overrun and construct a new segment to adjoin with Earhart Avenue. Thus, impacts, if any, would be temporary until the overrun improvements could be implemented.

(U) Overall, potential impacts would occur gradually as personnel and vehicle increases would occur over a seven-year period. It is unlikely that any increases would result in unsafe conditions given the base's road usage in previous years when base populations were higher. Additionally, the YAB IDP identifies several planned improvements to transportation which would help offset potential impacts from increased traffic. Planned improvements per the 2013 YAB IDP would serve to alleviate or help offset congestion at some locations, and remove any potential transportation concerns from the Proposed Action with regard to the north and south overruns. The Proposed Action would not have significant harm on transportation, as road use and gate activity would continue in a safe manner.

(U) Taxiways and Runways

(U) Vehicular traffic in the vicinity of the taxiways and runways would increase, particularly over the long-range as the proposed Phase II study area is somewhat equally removed from areas of the main base. Phase I actions, though occurring in the northern part of the base would not likely result in more traffic crossing the north overrun because it is assumed that most SOG-related traffic coming from the West Housing area would not continue past the Phase I study area. SOG traffic from the East Housing area would potentially result in an increase in vehicles through the south overrun if planned improvements have not been implemented prior to the SOG Phase II actions.

(U) During high-tempo flight operations, and prior to any planned improvements to the north and south overruns there would potentially be greater traffic backups and longer or more frequent delays as a result of the increase in vehicles, and the increase in sorties from proposed operations. The length of delay and frequency of occurrence is unknown. The delays would be an inconvenience but not a safety issue. Ultimately, planned improvements at the north and south overruns would alleviate traffic backups.

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(U) 4.10.2 Alternative 1

(U) With respect to increases in traffic, Alternative 1 would be similar to the Proposed Action. Access to and from the short-term area would involve most of the same roads with some differences. Potential transportation impacts arising from the Phase II actions would be the same given there are no differences in long-range actions between Alternative 1 and the Proposed Action.

(U) 4.10.3 No Action Alternative

(U) Under the No Action Alternative, traffic volume would not increase due to SOG personnel. The Air Force would not bed down the CV-22 aircraft, nor bring in additional personnel and vehicles. Planned improvements as discussed in the 2012 ADP would alleviate many existing base transportation issues. The No Action Alternative would have no significant harm on transportation.

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(U) 5. CUMULATIVE IMPACTS

(U) 5.1 REASONABLY FORESEEABLE FUTURE ACTIONS

(U) In addition to the actions evaluated in this ER, other future potential construction, consolidation, demolition, and beddown-related actions have been identified on and in the vicinity of YAB. Many of the construction, consolidation, and demolition projects are captured in the IDP (U.S. Air Force, 2013). The primary information source for other potential projects that could affect some of the same resources is the IDP (U.S. Air Force, 2013b). Specific current actions initiated by the host country that would have a cumulative effect were not identified while reviewing activities at YAB. In addition, no future planned host nation infrastructure or other actions at YAB were identified.

(U) 5.1.1 IDP

(U) The IDP is intended to guide all future development decisions at YAB for the next 30 years and to assist the installation to meet the Air Force's goals for mission capability, sustainability, readiness, and modernization. The objectives of the YAB IDP are as follows:

- (U) Consolidate existing infrastructure to allow for evolving mission growth.
- (U) Develop airfield infrastructure to support bilateral/joint operations.
- (U) Improve Western Pacific (WESTPAC) mobility hub capabilities.
- (U) Modernize and repair utilities infrastructure.

(U) Reasonably foreseeable infrastructure and facility improvement projects described in the IDP are listed in Table 5-1.

(U) Table 5-1. Future Potential Infrastructure and MILCON on Yokota Air Base

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Project Name	Project Summary
Consolidated Administrative Facility	Construct a consolidated administration facility for DFAS, 374 FSS, and potentially other base organizations.
Construct Yokota Stadium	Construct improvements to the east ball fields including bleachers and stadium improvements.
Construct AGE Facility	Construct a replacement aerospace ground equipment facility.
Construct JASDF CE Complex	Construct a new JASDF civil engineer complex and fire station.
Construct Tokorozawa Replacement Warehouse	Construct a replacement facility for the Tokorozawa warehouse, moving this storage on base from this geographically separated unit (GSU).
Demolish Buildings 004 and 104	Demolish Buildings 004 and 104 to enable the construction of a new consolidated administrative facility (project 01).
Demolish Building 79	Demolish the old freight terminal (Building 79).
Demolish AGE Buildings	Demolish Buildings 515, 583, and 584 after the replacement AGE facility is constructed.
Demolish Buildings for JASDF CE Complex	Demolish Building 4027 for construction of a new JASDF CE Complex.
Demolish Buildings for Warehouse Replacement	Demolish warehouse Buildings 933 and 943 for construction of the replacement Tokorozawa warehouse.

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Project Name	Project Summary
West Substation Repair/Reconstruction	Complete replacement of west substation, including downstream transformers. Decommission old west substation and demolish.
Convert/Demolish South Boiler Plant	Decentralize the steam heating system on the south portion of the base and decommission and demolish the south boiler plant.
Construct Temporary Steam Header House	Construct a temporary steam header house to repair steam lines.
Repair/Replace Main Steam Lines	Repair or replace steam main lines.
Fussa Gate Improvements	Provide canopies, security improvements, traffic medians, and additional lighting at the Fussa gate.
Terminal Gate Improvements	Provide canopies, security improvements, medians, and additional lighting at the Terminal gate.
East Gate Improvements	Provide canopies, security improvements, traffic medians, and additional lighting at the East Gate.
Replace Munitions Storage Facility	Replace the munitions storage facility, including Building 1310, reconstruct the berm to reduce QD arcs, reconfigure the hot cargo pad, and redirect the entrance of the munitions area to face north for safety.
Construct Water Storage Facility	Construct an additional elevated or ground-mounted water storage tank on the north side of the Main Base area to improve reserve water for fire fighting and domestic water pressures.
East Side Fitness Center	Construct an annex fitness center for the East Housing and Community Area after the demolition of Building 4304.
Yokota High School	Construct a replacement Yokota High School to meet current DoDEA specifications and improve the learning environment.
Construct New Classroom Building-Mendel Elementary School (DODDS MILCON)	Construct a classroom building to replace temporary classroom trailers.
Construct Addition on East Side Youth Center	Construct an addition to the east youth center (Building 1591) to increase capacity.
East Ramp Road	Construct a new loop road from Walker Boulevard to provide access to future aircraft maintenance facilities and POV parking areas in the proposed East Ramp redevelopment area.
Realign Walker Boulevard	Demolish Walker Boulevard on the north overrun, and construct a new alignment around the overrun, including reconfiguration of the existing berms.
Realign Airlift Avenue	Demolish Airlift Avenue between Eaker Street and Davis Street for construction of the CES Compound. Realign Airlift to join Mitchell Avenue.
Extend Mitchell Avenue	Realign and extend Mitchell Avenue from the Supply Gate to Earhart Avenue.
Restore Fenmoyer Street	Connect Fenmoyer Street to Kuter Street after demolition of the existing high school.
Demolish McGuire Avenue	Demolish and remove McGuire Avenue from the south overrun.
Realign Earhart Avenue	Improve Earhart Avenue from its intersection with Fenmoyer Street to the South Gate and construct a new road segment to McGuire Avenue to replace the former alignment of McGuire Avenue eliminated from the south overrun.
Extend Davis / Carswell Street	Extend Davis Street and Carswell Street to McGuire Avenue after demolition of Building 907.
Convert James Avenue	Extend and convert James Avenue for the exclusive use of fuel trucks, k-loaders, and munitions vehicles after demolition of McGuire Avenue.

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(U) Source: U.S. Air Force, 2013

(U) AGE = aerospace ground support equipment; CE = Civil Engineer; CES = Civil Engineering Squadron; DFAS = Defense Finance Accounting Service; DODDS = Department of Defense Dependant Schools; DoDEA = Department of Defense Education Activity; GSU = geographically separated unit; JASDF = Japan Air Self-Defense Force; MILCON = Military Construction; POV = privately owned vehicles; QD = quantity-distance

(U) 5.2 POTENTIAL IMPACTS

(U) Many of the construction, improvement, and demolition projects listed in Table 5-1 and described in the ADP would occur in previously developed areas consisting of existing buildings, impervious surfaces, and landscaped areas. Forested areas, although not prevalent on the base, could be impacted by some actions. Implementation of future projects on and near the base could affect natural, cultural, and environmental resources. Resource categories addressed in this section include airspace, noise, air quality, safety, transportation, utilities, hazardous materials and waste, water resources, biological resources, cultural resources, and socioeconomics.

(U) 5.2.1 Airspace

(U) The Air Force anticipates no significant cumulative harm to airspace use resulting from the Proposed Action or other relevant regional activity. It is anticipated that there would be no alteration of airspace structure, management, or use procedures at U.S. facilities and areas in Japan. Scheduling will address any potential conflicts. Any additional ATC support identified by PACOM will be negotiated with AFSOC for potential, additional Host Tenant Support. No additional airspace would be required, and Range Control would continue to provide direct communications with all users.

(U) 5.2.2 Noise

(U) Non-aircraft noise sources at YAB include vehicular traffic, equipment operation in support of aircraft operations, and construction activities. Construction-related noise would increase due to implementation of the projects identified in Table 5-1. It is expected that construction and operations noise could annoy some persons and disturb wildlife. However, it is expected that construction would generally be limited to normal working hours. In addition, construction noise would be intermittent and temporary, lasting only the duration of a given project. The project locations are distributed throughout the base, and, therefore, noise would not be concentrated at any one location. Furthermore, YAB currently experiences high noise levels from daily flight operations. Despite this, there is a potential for an increased number of complaints from members of the surrounding community. Cumulative effects could occur if annoyance sensitivity and public awareness increases as a result of implementation of the Proposed Action.

(U) 5.2.3 Air Quality

(U) The Air Force anticipates that future activities will include aircraft operations, as well as construction and demolition efforts. These efforts, along with construction worker trips and

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stationary and mobile equipment would increase air emissions. Asphalt paving activities tend to release VOC in relatively large quantities. However, these emissions are expected to be minimal in comparison to the regional emissions for each pollutant. In addition, with the exception of additional aircraft operations, most air emission increases would be short-term in duration. The Air Force does not anticipate significant harm to air quality due to the cumulative effects of future construction and demolition activities.

(U) 5.2.4 Safety

(U) The Air Force anticipates no significant cumulative harm to safety. YAB operational and safety constraints include clear zones and measures related to explosives, noise hazards, AT/FP, airfield obstructions, and electromagnetic radiation. The base would ensure that any future construction complies with explosive quantity-distance criteria and any other applicable safety measures. Future projects such as the replacement of the Munitions Storage Facility and improvements to the reserve water supply for firefighting activities are expected to offset or improve any potential safety impacts resulting from the beddown. Coordination with base safety personnel would be implemented when applicable. Increased operations associated with transient aircraft or other activities would increase the potential for accidents. However, with required safety measures in place, it is not anticipated that future construction and consolidation activities would significantly affect safety.

(U) 5.2.5 Utilities

(U) Future construction activities would result in increases in water and electricity consumption, and personnel additions would elevate overall utility use. With the addition of personnel and weapon systems, long-term impacts to most utilities is expected to be minor. The construction of an additional elevated or ground-mounted water storage tank on the north side of the main base area will increase available potable water and offset the additional personnel. Several other planned utility projects are expected to improve capacity and function of communications systems, fuel systems, heat conveyance, and overall capacity. The systems would not likely be significantly impacted by construction and demolition projects. Utility requirements would be considered during the planning phase. Actions that result in the addition of personnel would be evaluated for the effects on utilities.

(U) 5.2.6 Hazardous Materials/Waste and Solid Waste

(U) The Air Force anticipates no significant cumulative harm to the environment from generation of hazardous material/waste and solid waste since the current systems have excess capacity and all necessary requirements and regulations would be followed. Construction and operation of structures and facilities could generate additional hazardous materials, hazardous waste, and solid waste. Demolition of older buildings could result in accumulation of hazardous waste, including asbestos. Buildings would be inspected for the presence of asbestos prior to demolition, and if asbestos was found, it would be removed and disposed of in accordance with current procedures and regulations. It is assumed that the increase of other hazardous wastes generated by demolition activities would be gradual and capable of being managed by the current hazardous waste management procedures. Increases in hazardous waste due to the Proposed Action would not be expected to exceed the YAB hazardous waste storage capacity since

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construction and demolition actions would occur over a period of years. However, the base may require more frequent pick-ups of hazardous waste from the hazardous waste vendor. The base would continue to implement requirements of the *Hazardous Waste Management Plan* and *Hazardous Material Spill Prevention and Response Plan*.

(U) Solid waste management would be conducted in accordance with the JEGS. Solid waste would be recycled to the greatest extent feasible. In 2009, approximately 98 percent of C&D debris generated was recycled. Increased C&D activity owing to the implementation of the Proposed Action and other planned projects has the potential to negatively impact this number. Solid waste generated on the installation would also increase due to the addition of base personnel. This increase in solid waste would be diverted to the extent practicable. Waste that is not diverted would be incinerated or transported to an off-base landfill. As a result, the amount of generated waste would increase but would not be expected to significantly harm on-base or off-base environments. The increase could negatively affect the installation's 65 percent waste diversion goal. Inert debris (concrete, asphalt, dirt, brick, and other rubble) would be incorporated into reuse and recycling programs when possible. As a result, the Air Force does not anticipate cumulative harm to the environment from hazardous material, hazardous waste, or solid waste.

(U) 5.2.7 Water Resources

(U) The Air Force anticipates no significant cumulative harm to water resources if BMPs are implemented during the planning phase and all necessary guidelines and regulations are adhered to. Future planned actions such as refurbishing YAB water supply wells are expected to cumulatively improve water capacity and quality. In addition, the construction of an additional elevated or ground-mounted water storage tank on the north side of the main base area is expected to improve reserve water for firefighting and domestic water pressures. New construction resulting from the Proposed Action and other planned activities would remove negligible amounts of existing vegetation and increase impervious surfaces to a minor degree. Although any construction activity has the potential to increase stormwater conveyance and increase soil erosion and associated sedimentation of water resources, all present and future construction actions would follow policies and procedures outlined in the SWPPP to minimize the potential for impacts to drainage features on and off base. The base would continue to implement stormwater management techniques, which include erosion and sediment control measures, use of vegetative cover, diversion drains, grading management, filter strips, and sediment basins. In addition, the base would comply with the installation SWPPP, *Hazardous Waste Management Plan*, and *Hazardous Material Spill Prevention and Response Plan* during construction and operation. Stormwater drainage and treatment features are in place in existing developed areas, but would need to be constructed in areas of new development. Prevention of significant cumulative harm would likely require implementation of BMPs.

(U) 5.2.8 Biological Resources

(U) The Air Force anticipates little potential for cumulative harm to biological resources if BMPs are implemented during the planning phase and all necessary guidelines and regulations are adhered to. The majority of proposed future construction projects as well as the Proposed Action on YAB would occur in heavily developed areas. These areas consist of a composite of

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buildings, paved surfaces, and parcels of what appear to be maintained turf grasses and trees. The vegetated portions of these developed areas are generally small and isolated and are located near sites of ongoing human activity. Therefore, although birds, insects, and various other small wildlife species could periodically utilize these areas, they are not likely to function as principal habitat for native vegetation or wildlife on the base or the surrounding vicinity. Construction and renovation projects conducted in the vicinity of vegetated habitats, particularly forested areas, could result in cumulative harm to plant and animal species, including special status species. Management requirements such as relocation of protected species would likely be required in some cases to mitigate potential harm.

(U) 5.2.9 Cultural Resources

(U) The Air Force anticipates no significant cumulative harm to cultural resources if actions required by the YAB ICRMP and any necessary mitigations are implemented during the planning phase and all the necessary guidelines and regulations are adhered to. Cultural resources on YAB primarily consist of memorials, historic structures, and culturally significant natural features. In addition to documented cultural sites on the base, undocumented cultural features may exist as well. Although future construction plans would be designed to avoid known cultural resources, ground-disturbing activities have the potential to impact both known and unknown resources. For such actions, in accordance with the YAB ICMRP, a cultural resources site review must be conducted prior to any construction activities. That site review would include the creation of a site plan displaying the proposed footprint of activities and proposed work needed to identify and evaluate any cultural resources. Adherence to BMPs and operating procedures set forth in the ICRMP would minimize the risk of cumulative significant harm to cultural resources.

(U) Construction projects resulting from the Proposed Action and planned future actions are expected to result in short-term beneficial cumulative impacts to the local economy through the addition of construction jobs and need for additional goods and services to support new personnel and their families.

(U) 5.2.10 Transportation

(U) The U.S. Air Force anticipates a long-term beneficial cumulative impact to transportation infrastructure as a result of planned future activities. In the short term, the Proposed Action is expected to have a negative cumulative effect to transportation, as the addition of personnel will lead to increased traffic congestion and exacerbate a parking space shortage on base. In the long term, the Terminal Gate, East Gate and Fussa Gate improvements identified in the IDP would have beneficial impacts on transportation and would help offset potential impacts from the increased number of personnel and vehicles from the Proposed Action. Other planned parking improvements, roadway construction, extensions and closures are expected to improve access, safety and traffic flow on base.

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(U) 6. MANAGEMENT REQUIREMENTS

(U) 6.1 INTRODUCTION

(U) In this section, the analysis presented in Chapters 3 and 4 is applied to compile management requirements to be accomplished prior to or in conjunction with the Proposed Action to ensure there is no significant harm and to minimize as much as possible potential environmental impacts from the Proposed Action. The actions listed in the following sections would be implemented to address potential environmental harm associated with implementation of the Proposed Action.

(U) 6.2 GENERAL

- (U) **Recommended:** Implementation of management requirements and mitigations should be addressed through the YAB Environmental Management System (EMS) and in cooperation with the YAB EMS coordinator.

(U) 6.3 AIRSPACE

- (U) **Required:** Per AFI 13-204v3 PACAF Supplemental Attachment 18, AFSOC must coordinate with the 374 OSS Airfield Operations Flight and PACAF/A3TO to identify potential increases in qualified airfield operations manning (ATC and airfield management) due to increased flying operations.
- (U) **Recommended:** Any additional ATC support identified by PACOM will be negotiated with AFSOC for potential, additional Host Tenant Support.
- (U) **Recommended:** AFSOC should coordinate with YAB before beddown to ensure training areas can accommodate the increased operations.

(U) 6.4 NOISE

- (U) **Recommended:** Limit proposed construction and renovation activities to normal working hours (between 0700 hrs and 1700 hrs local time) to minimize resulting temporary annoyance.

(U) 6.5 AIR QUALITY

- (U) **Recommended:** Construction activities should employ standard management measures such as watering of graded areas, covering soil stockpiles, and contour grading (if necessary), to minimize temporary generation of dust and particulate matter.
- (U) **Recommended:** Diesel-powered highway and nonroad vehicles and engines used in construction should limit idling time to 3 minutes, except as necessary for

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safety, security, or to prevent damage to property; and such exhausts will be located the maximum feasible distance from any building fresh air intake vents.

(U) 6.6 SAFETY

- **(U) Required:** AFSOC must coordinate with range managers to ensure mission parameters minimize potential safety hazards.
- **(U) Required:** AFSOC must coordinate with YAB emergency and mishap response personnel to update response plans and procedures to include all necessary actions involving the Proposed Action.
- **(U) Required:** Aircrews operating in YAB airspace will follow applicable procedures outlined in the YAB *BASH Plan* (YAB, 2012b).

(U) 6.7 UTILITIES

- **(U) Recommended:** Use 12-inch diameter potable water piping wherever potable water pipes are replaced or installed.
- **(U) Required:** Upon removal/replacement of potable water piping, inspect pipes for presence of asbestos and dispose of asbestos properly.
- **(U) Required:** If the aircraft apron area is enlarged, additional storm sewer inlets and associated drainage routes must be constructed.
- **(U) Required:** All facilities requiring fire suppression systems require containment within the facility to meet Biochemical Oxygen Demand (BOD) discharge limits.
- **(U) Recommended:** New construction should implement energy- and water-efficient fixtures and appliances, such as low-flow toilets, Energy-Star products, and compact-fluorescent light bulbs, where applicable.

(U) 6.8 HAZARDOUS MATERIALS AND SOLID WASTE

- **(U) Required:** Ensure that all actions are conducted in accordance with the JEGS, AFI 32-7042, the *Hazardous Waste Management Plan*, *Hazardous Material Management Plan & Ozone Depleting Substances Management Plan*, *Spill Prevention and Response Plan*, and all other applicable policies and regulations described in Section 3.6.2, Policies and Regulations.
- **(U) Required:** Conduct surveys for asbestos, PCBs, and lead paint before renovation or repair of existing structures.
- **(U) Required:** Ensure that C&D debris generated by construction contractors is reported to the base P2 manager.

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(U) 6.9 WATER RESOURCES

- **(U) Required:** Prior to the initiation of any construction or earth-moving activities, ensure proper erosion control measures are put in place.
- **(U) Recommended:** Cover waste receptacles, including dumpsters, to prevent rainwater from entering and creating stormwater runoff with dissolved receptacle waste.
- **(U) Recommended:** Pre- and post-construction, the SWPPP recommends a maintenance schedule for visual inspections of the major outfalls to observe whether structural controls are working (to reduce downstream sedimentation and collect debris conveyed by the stormwater management system) or in need of repair.

(U) 6.10 BIOLOGICAL RESOURCES

(U) The JEGS require that installations take reasonable steps to protect and enhance endangered, threatened, and otherwise protected species and their habitat. The following recommendations would facilitate compliance with this requirement.

- **(U) Recommended:** Before Phase II actions begin, conduct site surveys for the presence of protected plant species and for the presence of trees.
- **(U) Recommended:** If found, relocate any protected plant species that would be impacted by construction activities.
- **(U) Recommended:** Avoid impacts to trees to the extent practicable.
- **(U) Recommended:** Relocate any trees with natural or cultural significance that would be impacted by construction activities, as feasible; relocation sites would be compatible with the species' physical requirements.

(U) 6.11 CULTURAL RESOURCES

(U) As per Section C12.3.4 of the JEGS (U.S. Forces Japan, 2012) "Installations shall, after coordination with the appropriate Japanese governmental authorities, prepare, maintain, and implement a cultural resources management plan that contains information needed to make appropriate decisions about cultural and historic resources identified on the installation inventory, and for mitigation of any adverse effects." The following mitigations are resultant from the ICRMP developed in accordance with the JEGS requirement (Verhaaren, 2007):

- **(U) Required:** If significant resources are to be harmed, mitigation measures may include one or some combination of the following: limiting the magnitude of the action; relocating the action in whole or in part; repairing, rehabilitating, or restoring the affected resources; and recovering and recording data from cultural properties that may be destroyed or substantially altered.
- **(U) Required:** If culturally sensitive species cannot be avoided during development, relocation and replanting may be possible in some situations. During tree removal

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operations, care will be used to minimize potential harm to any tree species considered culturally significant.

- **(U) Required:** Ensure that the discovery of any undocumented cultural resources would force work on the Proposed Action to cease and the appropriate actions regarding unanticipated discoveries described in the base ICRMP and JEGS would be implemented.
- **(U) Recommended:** If changes are made to a structure during adaptive reuse preservation of historic features is recommended. Original elements should be retained, if feasible. If mission requirements render the retention of original elements impractical, they should be replaced with materials that match the style of the original features.

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